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DOE/ET/27112-5(Vol.1)
(DE84002532)

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**GEOPRESSURED GEOTHERMAL BIBLIOGRAPHY,
VOLUMES I AND II**

By
Kamy Sepehrnoori
Frances Carter
Robert Schneider
Steve Street
Kira McGill

May 1983
Date Published

Work Performed Under Contract No. AC08-79ET27112

Center for Energy Studies
The University of Texas at Austin
Austin, Texas

Technical Information Center
Office of Scientific and Technical Information
United States Department of Energy

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Geopressured Geothermal Bibliography

Volume I (Citation Extracts)

Second Edition

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Prepared for the

U.S. Department of Energy
Division of Energy Technology

Under contract DE AC 08 79 ET 27112

Date Published - May 1983

ACKNOWLEDGMENTS

This project was the cooperative effort of several people. Dr. Kamy Sepehrnoori was the principal investigator. Frances Carter served as the project manager, and Robert Schneider functioned as a programmer analyst for this project. Steve Street acted as associate editor and Kira McGill, as data entry operator. Special thanks go to the contributors to the first edition.

THE GEOPRESSURED GEOTHERMAL INFORMATION SYSTEM STAFF WANTS YOU AND OTHER KNOWLEDGEABLE PERSONS TO SUGGEST ARTICLES, PAPERS, AND ANY OTHER WORK DEALING WITH FINDING, AND EXPLOITING GEOPRESSURED GEOTHERMAL ENERGY. TO HELP US IN OUR TASK THAT WE MAY HELP YOU IN YOURS, PLEASE FILL IN THE BLANKS BELOW AND RETURN THIS FORM TO

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CENTER FOR ENERGY STUDIES, ENS143
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TX 78712 (U. S. A.).

=====
Author(s): _____

Title: _____

Subtitle?: _____

Where the work appeared: Conference? Journal? Monograph,
report,
book, other?

Publisher, conference, or
journal's name: _____

Date: _____ Volume: _____ Number: _____ Page: _____
or Report Number (if known): _____

There is space on the back for you to describe the work if you would like to do so.

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The Geopressured Geothermal Information System Bibliography (GEOBIB) contains material to help researchers do work in geopressured geothermal energy. This material derives from conferences and other meetings, journals, reports, monographs, and other sources.

The success of an information system requires it to accommodate use. What you tell us in this questionnaire will help it to do so.

1. What particular disciplines related to geopressured geothermal energy would you have a particular interest in being included in GEOBIB?
2. Are there any other particular terms which you would like to suggest for helping you find material in GEOBIB?
3. Do you know, or have possession, of any items of unpublished or not very widely distributed literature which you believe would be helpful? Could you tell us what, and where we might find it?
4. Could you provide the Geopressured Geothermal Information System with a copy, either in xerography or some other medium?
5. Are there other items besides author, title, and particulars of publication which you like research information systems to provide, and if so, which ones?

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1.0 Introduction

The Center for Energy Studies at The University of Texas at Austin has compiled the GEOPRESSURED GEOTHERMAL BIBLIOGRAPHY for researchers in the field of geopressured geothermal energy resources. It represents reports, papers and articles appearing over the past eighteen years covering topics from the scientific and technical aspects of geopressured geothermal reservoirs to the social, environmental, and legal considerations of exploiting those reservoirs for their energy resources.

1.1 Scope of Work

Citations in the bibliography fall into two groups. One group contains citations in which the primary topic is geopressured geothermal energy resources. All other citations concern subjects which, while not always directly related to geopressured geothermal energy resources, may still be of interest to researchers in that field.

Over 350 new titles have been added to this edition of the bibliography, bringing the total to near 1100. This edition has also been reformatted to eliminate extraneous information and includes corrections to the previous bibliography and additional abstracts.

1.2 Using the Bibliography

The bibliography has three parts: the Introduction, Citation extracts, and the Indices.

The Introduction serves as a guide for using the bibliography. It explains the organization of the bibliography, the nature of the contents, and methods for quickly retrieving information on a particular subject. The Introduction also describes how the bibliography was compiled.

The main body of the bibliography is a listing of citations and was compiled from a computerized data base wherein all available information about an entry is stored. The information of each citation has been arranged and formatted for the convenience of the user.

For quick reference to a given topic, the citations are indexed into six divisions: author, conference title, descriptor, journal title, report number, and sponsor. These indices are arranged alphabetically and are cross-referenced by page number.

1.3 Limitations of the Bibliography

The bibliography is generated entirely on a computer and, as a result of the hardware devices with which the document is printed, there are

Geopressured Geothermal Bibliography

limitations to character representations. For example, temperature in degrees is represented in the data base as DEG C or DEG F and is printed as such in the bibliography. Math notation has some altered representation: e.g. five times ten to the third power will be printed $5 * 10 ** 3$. Because the computer printer is unable to do subscripting, a chemical formula will be printed without it (e.g., SiO subscript 2 will be written as SiO2).

1.4 Data Components

The bibliography is compiled from a data base that contains certain pertinent information available for each citation.

The first line of each entry is a reference line containing information about the source of the citation. This line begins with "GGIS-" followed by a number and two letter characters. The number is the GGIS document reference number and is used only by the data base. The first letter represents the document type, e.g. "A" stands for "analytic", "M" for "monograph", "S" for "series", and "C" for "collection". The second letter--or blank if no data value is present--represents the citation's bibliographic level indicator: "O" for "proceedings", "J" for "journal", "D" for "drawing", "F" for "film", "G" for "map", "H" for "audio", "I" for "miscellaneous", "T" for "computer medium", "B" for "book", "P" for "patent", or "R" for "report". The list of citations is arranged alphabetically according to the primary title of each citation. A title augmentation line may appear in parentheses below the title, in which case more specific information pertaining to the subject of the citation may be found. For example, if the title of the publication is "Eugene Island Block 18 Field", the title augmentation is "(Paper 8 in Offshore Louisiana Oil and Gas Fields)". Should the citation have a subtitle it is so listed and follows immediately after the title line and the title augmentation line, if any. For documents that have been translated into English, the original title and subtitle have been stored in the data base and can be found in the listing prefaced by either "Original Title-" or "Original Subtitle-", and printed in the original language of the citation.

The name or names of the primary person or persons responsible for the publication have their listing prefaced by "Author(s)-" and are printed by surname followed by first name or initial. Multiple authors are listed as they appear on the document. If the publication was presented at a meeting, the title of that meeting can be found in the citation listings prefaced by "Conference-". The conference title is as exact as the publication permits and may be as simple as "Abnormal Subsurface Pressure" or as detailed as "AAPG Annual Meeting, Houston, Texas, 1979". The publisher of a document is found in the listing beside "Publisher-". The publisher's name, publication place and date, and any additional information contained in the data base on the publication of a document follow. If the document cited is a journal article, the journal title is found on the "Journal-" line in the citation listing and normally appears in its abbreviated form. A list of these abbreviations and their full titles is appended at the end of the bibliography. Dates of publication are found in "month/day/year" for reports, "volume number/issue number and month/day/year" for journal articles. These dates are found in the listing after "Publication date-".

After "Pagination-" the total number of pages of a monograph is listed. For journal articles, chapters from a report, or papers from a conference,

the page number at which the article begins is listed followed by the total number of pages in the article. The report/patent number of a document is listed after "Report/patent-", and a short comment on the report/patent number may follow the number itself. Any statement or information about a document, such as related works or conference origins, etc., follows in the line prefaced by "Note-". When the language of a published document is other than English, the original language is referred to in the line beginning "Language-". In some cases the data base contains several pieces of information about the availability of a citation. If this information is in the data base, it will provide the name of the supplier, or an abbreviation such as "NTIS" (National Technical Information Service), and an address where the supplier can be contacted. If the document is available in a variety of forms, paper copy or microfiche, these forms are listed. Interested persons should contact the supplier of the document for current information regarding both its availability and price. This information is found in the citation prefaced by "Available-".

For those associated with The University of Texas at Austin, information can be found within the data base about the local availability of the document. This information is listed in the citations as "Local availability-". When this information is found in the listing, it is the abbreviation of the university library that holds the document. Documents that were published under the sponsorship of an organization have as a data component the name of this organization. The names of these organizations can be found listed in the citations where the line is prefaced by "Sponsor-". If the sponsorship contract number under which the document was prepared is available to the data base, it is printed on the line immediately below the name of the sponsor. The citation listing may contain a reference to a corporate author. This can be found in the listing prefaced by "Corporate author-". In most cases this is the organization for which the author of the paper works. In the absence of an author, the corporate author will be the organization that takes responsibility for the content of the document. Further information about the corporate author, such as the address, can be found on lines following the listing of the name of the corporate author.

If a document cited contains illustrations (charts, graphs, maps, diagrams, figures, etc.), tables, or references, they can be found in the citation listing under "Auxiliary expression(s)-". The number of illustrations may also be listed. Terms which narrowly define the content of the document can be found prefaced in the citation by "Descriptors-". These terms have been chosen from the thesaurus that is maintained by the Geopressured Geothermal Information Service (GGIS). Most documents are abstracted. These are found in the citation listing beginning with "Abstract by-" and then a name, either "Author", or "GGIS", "TIC", and so forth. The abstract of the document follows thereafter.

1.5 Bibliography Availability

Paper copies of the bibliography are available in two forms, one a bound listing on standard letter-size paper available from NTIS, the other an unbound listing on standard computer paper at a cost of \$20.00. To obtain a copy of the computer printout please write to:

Geopressured Geothermal Bibliography

Geopressured Geothermal Information Service
Center for Energy Studies
The University of Texas at Austin
ENS 143
Austin, Texas 78712

Other Department of Energy projects may obtain machine readable copies of the bibliography and are available through two media, one being either an 800BPI, or 1600BPI, or 6250BPI magnetic tape at a cost of \$50.00, the other through the Advanced Research Projects Agency computer network (ARPAnet). Please contact GGIS@UTEXAS through the ARPAnet mail for further information.

1.6 Thesaurus

A thesaurus that was developed in coordination with the bibliography is also available. The thesaurus contains the authorized citation descriptors as well as the hierarchy and relationship of the descriptors used with each citation in the bibliography.

1.7 Other Services

Data bases of digitized well logs and well log header information are also available. There are several application programs which use these data bases for well log analysis, computer plotting of well logs and other information obtained from well logs, and computer-generated color graphics.

Additionally, the Center for Energy Studies maintains the Energy Information Service which houses paper copy and microfiche copies of many documents found in the bibliography as well as many other energy-related documents.

2.0 Citations

1. GGIS-100110/ / / /M/ / / / /

Title- 'Chemical Caps' Can Cause Pressure Buildup

Subtitle- (In Well Logs - A Basic Drilling Tool)

Author(s)- / Louden , L. R. /

Pagination- Page 45 , 3 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Well logging / Uses / Pressure buildup / Measurement
/ Geopressure / Origin / Seals / Shale /

2. GGIS-100308/0/ / /A/ / / / /

Title- A Comparative Analysis of Energy Costing Methodologies

Author(s)- / Goldstein , Steven / Trehan , Ranvir / El-Sawy , A. /
Leigh , J. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 223 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Mitre Corp.

METREK Div.

McLean , Virginia , USA

Auxiliary expression(s)-

Table

Illus. / Graph (2) /

Descriptor(s)- / Cost / Energy source development / Economics /
Electric power / Engineering / Geothermal energy / Investment /
Models / Power generation / Taxes /

Abstract by Author

This paper is a comparative analysis of the methodologies used by 14 organizations active in various aspects of geothermal energy development to compute the levelized busbar costs of electricity from hydrothermal resources. Available busbar cost estimates reflect different interest and taxation rates, amortization periods, special allowances and other differences in assumptions and methodologies. The study focused on two major sources of differences: those related to different approaches to estimating engineering costs; and those arising from different

Geopressured Geothermal Bibliography

assumptions and procedures in the financial models which convert engineering costs to busbar costs.

3. GGIS-100393/O/ / /A/ / / / /

Title- A Comparison of Selected Parameters From Tested Geopressured-Geothermal Wells

Author(s)- / Ham , Russell A. / Beck , James N. / Chavanne , Raymond E. / Palermo , Joseph I. / Rogers , Stearns W. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1372 , 17 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Corporate Author- NcNeese State Univ.

Lake Charles , LA , USA

Auxiliary expression(s)-

Illus. / Graph (5.) /

Table

Ref.

Descriptor(s)- / Dissolved solids / Edna Delcambre No. 1 Well / Fairfax Foster Sutter No. 2 Well / Geopressured wells / Geothermal fluids / Louisiana / Ph value / Radioactivity / Sampling / Silicate minerals / Water analysis / Zinc /

Abstract by Author

Selected results of analysis of fluids from the Edna Delcambre #1 and the Fairfax Foster Sutter #2 wells are presented. A comparison of parameters such as Ph, silicate, and total dissolved solids are made between the two wells. Chemical and mechanical factors are cited to explain differences in these parameters.

4. GGIS-100393/O/ / /A/ / / / /

Title- A Comparison of Six Geopressured-Geothermal Prospect Areas in the Louisiana Gulf Coast Region the Basis of Potential Environmental Impacts

Author(s)- / Newchruch , Edwin J. / Van Sickle , Virginia R. / Bachman , Ann L. / Bryan , Charles F. / Muller , Robert A. / Smith , Charles G., Jr. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1389 , 25 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA
 (Paper copy)
 Local Availability- CES
 Sponsor- / Department of Energy, Washington, DC (USA). Div of
 Geothermal Energy
 ET-78-S-05-5762 /
 Auxiliary expression(s)-
 Illus. / Map (1) /
 Table
 Ref.
 Descriptor(s)- / Air pollution / Comparative evaluations / Ecosystems
 / Baseline ecology / Environmental impacts / Flooding /
 Geopressure exploration / Geopressured zones / Ground subsidence
 / Hurricanes / Land use / Louisiana / Noise pollution /
 Seismicity / Testing / Water pollution /

Abstract by Author

Under the sponsorship of the Division of Geothermal Energy of the U.S. Department of Energy, a preliminary environmental assessment was made of six geopressured geothermal prospect areas in the Louisiana Gulf Coast region as follows: South Johnson's Bayou, Sweet Lake, Rockefeller Refuge, Southeast Pecan Island, Atchafalaya Bay, and Lafourche Crossing. An attempt was made to determine, for each prospect area, whether the three-year reservoir testing program proposed by DOE would be likely to result in significant detrimental environmental effects. Baseline data for each prospect area was compiled from existing sources, and trade-offs among the prospects in terms of potential impacts were assessed. This assessment was made on the basis of the nature and extent of the proposed testing activities, in view of the environmental characteristics of each prospect area as regards land use, geology and geohydrology, air quality, water resources and quality, ecological systems, and natural hazards. Based on this study, it is believed that the test program activities, because they are so small in scale, will not result in major adverse impacts. No prospect area, with the possible exception of Rockefeller Refuge, needs to be excluded from consideration for the test well program.

 5. GGIS-100528/0/ / /A/ / / / /

**Title- A Computer Program for Predicting Surface Subsidence
 Resulting from Pressure Depletion in Geopressured Wells**

(Technical Note)

Subtitle- Subsidence Prediction for the Dow Test Well No. 1,
 Parcperdue, Louisiana

Author(s)- / Janssen , James C. / Carver , Dale R. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (
 October 13 , 1981)

Publication date- 1981

Pagination- Page 281 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Figure (2) /

Ref.

Geopressured Geothermal Bibliography

Descriptor(s)- / Aquifers / Computer codes / Geopressured wells /
Ground subsidence / Lafayette Parish / Louisiana / Vermilion
Parish /

Abstract by GGIS

The authors have developed a computer program to predict surface subsidence caused by pressure reduction in a geopressured reservoir. The program takes information on boundary locations and aquifer thicknesses and creates a surface grid. Then, at each point on the grid the sum of the drawdown of each of the finite volumes is calculated using Geertsma's formula. This calculated sum represents the maximum amount of subsidence at that point.

6. GGIS-100144/B/ / /M/ / / / /

Title- A Computer Simulation Model for Two-Phase Wellbore Flow of
Geopressured Geothermal Fluid with Emphasis on
Texas-Louisiana Gulf Coastal Fairways

Author(s)- / Rhode, David L. / Lamb, J. Parker /

Publication date- February 14, 1978

Pagination- 78 Pages

Available- Center for Energy Studies

Engineering Science Bldg. 143

University of Texas at Austin

Austin

Texas

78712

Corporate Author- Texas University, Austin

Center for Energy Studies

Austin, Texas, USA

Auxiliary expression(s)-

Illus. / Diagram (5) / Graph (15) /

Table

Ref.

Descriptor(s)- / Flow rate / Gulf Coast / Louisiana / Mathematical
models / Simulation / Texas / Thermal conductivity / Two-phase
flow / Well characteristics /

Abstract by Author

This report describes the development of a numerical simulation for wellbore flows of geopressured geothermal fluid wherein the liquid phase is a saturated solution of methane in water and the vapor phase is pure methane. The two-phase flow structure is assumed to be in the homogeneously distributed bubble regime. Governing equations in one-dimensional form are solved simultaneously for each segment of the flow string, beginning at the bottom of the well and marching toward the wellhead. The effect of fluid heat loss for each tube length segment is determined from the exact analytical solution for heat conduction between the tube and an infinite, homogeneous material (i.e. the assumed character of the geological formation). Results of a subsequent sensitivity analysis of physical parameters (such as bottom hole conditions, geological thermal properties, and tube diameter) on wellhead fluid properties are plotted and analyzed. Further, all physical parameters are categorized into one of two groups depending on the degree of influence each exerts on wellhead properties.

These results are expected to be useful to those designing surface equipment for geopressured geothermal wells.

7. GGIS-100528/O/ / /A/ / / / /

Title- A Correlation of Published Data on the Solubility of Methane in H₂O-NaCl Solutions

Author(s)- / Coco , Leonard T. / Johnson , Adrian E. /
Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 215 , 6 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AS05-78ET27160 /

Auxiliary expression(s)-

Illus. / Graph (1) /

Table

Ref.

Descriptor(s)- / Correlation / Equations / Mathematical models /
Methane / Solubility / Thermodynamics /

Abstract by GGIS

A new correlation of the available published data for the solubility of methane in water was developed, based on fundamental thermodynamic relationships. An empirical relationship for the salting-out coefficient of NaCl for methane solubility in water was determined as a function of temperature. Root mean square and average deviation for the new correlation, the Haas correlation, and the revised Blount equation are compared.

8. GGIS-100407/O/ / /A/ / / / /

Title- A Cost Comparison Between Geothermal and Cogeneration Sources of Process Heat

Author(s)- / Guillaumon-Duch , Higinio /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 735 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Geopressured Geothermal Bibliography

Sponsor- / Department of Energy, Washington, D.C. (USA) /

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (1) /

Table

Ref.

Descriptor(s)- / By-products / Charges / Co-generation / Comparative evaluations / Cost / Economics / Electric power / Equations / Hot water systems / Industrial heating / Industrial plants / Power generation / Process / Recovery processes / Technology assessment /

Abstract by GGIS

Two options for obtaining industrial process heat which usually are not compared are the use of geothermal fluids vs. cogenerating from fossil fuels. The usual comparison is that which compares the economics of geothermal energy with the economics of direct fossil fuel production of process heat. A case specific method of appraising low temperature liquid dominated geothermal resources for industrial process heat is presented. Generalizing from expected results, it is reported that using geothermal fluids of temperatures below 350 deg F would be less economic than cogenerating process heat.

9. GGIS-100393/O/ / /A/ / / / /

Title- A Description of the Technoeconomical Model Used to Analyze the Development Potential of Louisiana Geopressured Energy Prospects

Author(s)- / Wrighton , Fred M. / Johnson , Adrain E., Jr. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3, June 1980

Pagination- Page 1484, 15 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Corporate Author- Louisiana State Univ.

Baton Rouge , USA

Auxiliary expression(s)-

Illus. / Diagram (3) /

Table

Descriptor(s)- / Commercialization / Computerized simulation / Cost / Economics / Geopressure power plants / Geopressure resources / Louisiana / Models / Optimization / Resource development / Resource potential / Systems analysis /

Abstract by Author

This paper provides a description and explanation of the technoeconomic simulation model used in the analysis of the commercial potential of geopressure/geothermal prospects in Louisiana. This model has been developed and refined over the last year by members of the LSU Operations Research team in conjunction with the analysis of geopressure/ geothermal resources in Louisiana. This interdisciplinary development has

produced a comprehensive model that provides substantial flexibility for the user to explore different alternatives in the simulation of a specific prospect. In addition to this feature, the model also incorporates an optimization subroutine that will solve for the optimum value of a specified parameter, either technical or economic, that would make a given prospect commercially viable. Although the model has been used predominately as a deterministic simulator, there is provision for probabilistic solutions.

10. GGIS-100237/J/ / /A/ / / / /

Title- A Firm Future with Natural Gas

Author(s)- / Lawrence , George H. /

Journal- Am. Gas. Assoc. Mon.

Publication date- Vol. 60 , Issue 5 , May 1978

Pagination- Page 12 , 4 Pages

Descriptor(s)- / Biomass / Charges / Coal / Deregulation / Economics /
Energy resources / Energy supplies / Gas production /
Geopressured zones / Methane / Natural gas /

Abstract by Energyline

If the U.S. continues to use natural gas at greater rates but fails to provide producers with more money, the premium fuel will be unable to supply a major portion of the nation's energy needs. AGA, businesses, and interest groups are calling for deregulation of the wellhead price of new gas. Supplemental resources from LNG importation, coal gasification, the Alcan pipeline project to carry gas from Alaska, coal beds as a methane source, geopressured zones, and biomass conversion are discussed.

11. GGIS-100528/O/ / /A/ / / / /

Title- A Fundamental Study of the Effect of High-Salinity Brines on the Friction and Wear Properties of Stainless Steel

Author(s)- / Pearsall , K.J. / Gorin , G. / Eliezer , Z. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 133 , 3 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA) /

Auxiliary expression(s)-

Illus. / Diagram (3) /

Ref.

Descriptor(s)- / Brines / Corrosive effects / Corrosion monitoring /
Experimental results / Stainless steels /

Abstract by Author

Friction and corrosive wear experiments were performed in a geothermal-geopressured brine and in a 3% NaCl solution in a friction and wear electrolytic cell. The formation of a passive film on 304 stainless steel has a beneficial effect on the magnitude of the coefficient of friction. When pits are

electrochemically introduced in the passive film, the friction coefficient becomes even lower than the passive coefficient of friction in the 3% NaCl, but does not significantly change for the brine. The effect of corrosive wear on the surface film is more difficult to assess. Auger spectroscopy was performed on wear surfaces (subjected to both electrochemical and mechanical action) and non-wear surfaces (subjected only to electrochemical action). The surface films formed in 3% NaCl in the non-wear and wear areas including pits consisted of Cr, Fe and Ni in ratios consistent to the bulk material plus O. In brine the surface film consists of the same elements as above; however, the surface film associated with the non-wear area and the wear area pit show a Cr depletion. Yet, the wear area film is consistent with bulk as in the case of the 3% NaCl.

12. GGIS-100393/O/ / /A/ / / / /

Title- A Legal-Regulatory Status Report for Texas

Author(s)- / Oberbeck , Arthur W. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1468 , 16 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Descriptor(s)- / Energy source development / Environmental policy /
Geopressure resources / Ground subsidence / Legal aspects /
Legislation / Mineral rights / Ownership / Regulations / State
government / Texas / Waste disposal /

Abstract by Author

State actions to alleviate legal problems in geopressured-geothermal resource development in Texas are summarized. Legislative actions include a policy statement on resource ownership and a clarification of responsibility for waste disposal. The Railroad Commission has modified some regulations. Federal environmental regulations, particularly new programs proposed to implement statutes not yet enforced, are reviewed. These include a new hazardous waste management system proposed to implement the Resource Conservation and Recovery Act, a modified proposal for underground injection controls under the Safe Drinking Water Act, and new rules for prevention of significant deterioration of air quality under the Clean Air Act. Continuing legal problem areas not yet resolved, generally because of inadequate technical knowledge of reservoir characteristics and long-term performance, are surveyed. Requirements and methods for the protection of correlative rights and prevention of resource waste, and legal and technical uncertainties associated with potential subsidence are examples. Unresolved problems of balancing energy needs against environmental protection should continue the administrative

complexity and resultant delays experienced in other natural resource development.

13. GGIS-100058/J/ / /A/ / / / /

Title- A Look at the Upper Wilcox Rosita Delta System of South Texas

Author(s)- / Edwards , Marc B. /

Publication date- Vol. 78 , Issue 19 , May 12 , 1980

Pagination- Page 197 , 5 Pages

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (4) / Map (2) /

Ref.

Descriptor(s)- / Deltas / Geologic structures / Geology /
Geopressed reservoirs / Sandstone / Sedimentology / Texas /
Wilcox Formation /

Abstract by FC

The purpose of this study was to locate sandstone reservoirs suitable for geopressed geothermal energy production. Their location has been determined by correlating approximately 500 well logs with a structure map of the Wilcox system.

14. GGIS-100308/O/ / /A/ / / / /

Title- A Low Temperature Geothermal Space Heating Demonstration Project

Author(s)- / Austin , John C. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 23 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (1) / Photo (2) /

Descriptor(s)- / Economics / Environmental effects / Geothermal resources / Geothermal space heating / Heat exchangers / Idaho / Low temperature / Uses /

Abstract by Author

A demonstration project for the State of Idaho utilizes 170 DEG F geothermal water from well sources established in 1892. The project is a retrofitted gas-fired system serving three buildings. Two separate water loops are interfaced through a primary heat exchanger. The geothermal loop is capable of delivering up to 400 gpm at 166 DEG F to the exchanger which transfers about eight million Btuh to the space heating loop.

Geopressed Geothermal Bibliography

The spent geothermal water is cooled and aerated, then discharged to the Boise River. The second loop is a closed system including the existing boiler, pumps, and piping retrofitted to the new heat exchanger. In addition to demonstrating the technology to utilize low temperature sources for space heating, the project examines economic feasibility, environmental impacts, and materials effects.

15. GGIS-100002/0/ / 3/A/ // //

Title- A Method of Determining Permeability by Means of a Pulsed NMR and an Application of the Method to the Study of A Gulf Coast Supernormally Pressured Well

Author(s)- / Stevens , D. O. /
Conference- Abnorm. Subsurf. Pressure
Baton Rouge
Louisiana
USA

Publication date- Vol. 3 , 1972

Pagination- Page 67 , 4 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Gulf Coast / Engineering geology / Geopressed reservoirs / Overburden pressure / Boreholes / Pressure buildup / Geopressure / Permeability / Measurement / Nuclear magnetic resonance /

16. GGIS-100221/J/ / /A/ // //

Title- A Method of Quick Calculation of the Geostatic Component of Geopressure to Be Used in Predicting Abnormal Pressures

Author(s)- / Gudok , N. S. /

Journal- Geol. Nefti Gaza

Publication date- Vol. 12 , 1975

Pagination- Page 56 , 4 Pages

Language- Russian

Descriptor(s)- / Petroleum production operations / Calculation methods / Geopressure / Geostatic pressure /

17. GGIS-100328/R/ / /C/ // //

Title- A National Plan for Energy Research, Development and Demonstration:

Subtitle- Creating Energy Choices for the Future

Publication date- June 30 , 1976

Report/patent- ERDA 76-1

Local Availability- CES

Corporate Author- U.S. Energy Research and Development Administration
Washington , D.C. , USA

18. GGIS-100528/O/ / /A/ / / / /

Title- A Note on Effective Stress

Author(s)- / Carver , Dale R. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 285 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-81NV10174 /

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Compaction / Compressibility / Equations / Pore pressure / Porosity / Stresses /

Abstract by Author

There are three "effective stresses" commonly used in describing the behavior under load of porous rocks with high pore pressure. Denoting by σ the actual normal force per unit of gross area (including pore area) transmitted from one cross section to its adjacent cross section at any point and in any direction in a porous media (the conventional definition), by P the pore pressure and by ϕ the porosity, these three effective stresses are $\sigma - P$, $\sigma - \phi P$ and $\sigma - \alpha P$, in which $\alpha = 1 - C_s/C_b$ with C_s being the compressibility coefficient of the matrix material itself and C_b being the bulk compressibility. The use of the term "effective stress" without qualification leads to confusion in the literature. It is the purpose of this note to explain the simple physical significance of these stresses, to point out that there are two commonly used expressions for future investigators to utilize precise definitions of terms in this developing field of study.

19. GGIS-100006/O/ / /A/ / / / /

Title- A Note on Geological and Engineering Strain Rates, Hydraulic Fractioning, and Slope Stability

Author(s)- / Price , Neville J. /

Conference- IRPI (CNR)

Publisher- IRPI (CNR)

Pisa, Italy

Publication date- Vol. 8 , Issue 1 , 1973

Pagination- Page 57 , 7 Pages

Auxiliary expression(s)-

Illus.

Sum.

Descriptor(s)- / Fractures / Origin / Shear / Loading / Pore-fluid pressure / Theoretical studies / Geopressure / Engineering geology / Slope stability / Hydraulic fracturing / States / Strain / Effects / Fluid pressure / Gulf Coast /

20. GGIS-100393/O/ / /A/ / / / /

Title- A Preliminary Creep Analysis of Rocks from the Pleasant Bayou Wells

Author(s)- / Thompson , Thomas W. / Gray , Ken E. / McDonald , Robert C. / Jogi , Pushkar N. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 2 , June 1980

Pagination- Page 1060 , 21 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS

Austin

TX

78712

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

DE-AC08-79ET-27112 /

Corporate Author- Texas Univ.

Center for Earth Sciences and Engineering

Austin , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (6) /

Table

Ref.

Descriptor(s)- / Compaction / Creep / Drill cores / Elasticity /

Geopressured reservoirs / Models / Pleasant Bayou No. 1 Well /

Pleasant Bayou No. 2 Well / Rock deformation / Simulation /

Strains / Stresses / Texas / Time dependence /

Abstract by Author

Some cores retrieved from the Pleasant Bayou wells show pronounced time-dependent behavior. This time dependence is evident under both hydrostatic and deviatoric loading, and in drained and undrained tests. Preliminary models have been set up to analyze these preliminary data based on linear viscoelastic models. It will be shown that these models go some way towards describing the observed behavior, but that non-linearity must be accounted for. The significance of this nonelastic behavior to production and subsidence analysis is discussed.

21. GGIS-100407/O/ / /A/ / / / /

Title- A Primer on Economic Feasibility for Direct-Users

Author(s)- / Eastlake , William B. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 703 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

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95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (1) /

Table

Ref.

Descriptor(s)- / Capital / Commercial buildings / Comparative
evaluations / Conversion / Cost / Cost benefit analysis / Direct
energy utilization / Economic analysis / Economics / Financing /
Geothermal heating / Geothermal space heating / Investment /
Profitability / Profits /

Abstract by GGIS

An introduction to the analysis of the economic feasibility
of geothermal direct use projects is presented in this report.
Two areas for economic analysis are: the cost comparison of
conventional fuels with geothermal fuel, and the payback and
internal rate of return that a geothermal investment would
provide as compared with other possible investment choices.
Each part of the analysis should show a favorable comparison if
geothermal fuels are to be used. The decision points and
alternatives are depicted in flow chart format, and a
hypothetical geothermal space heating system is analyzed using
the specified procedure.

22. GGIS-100393/0/ / /A/ / / / /

Title- A Report on the Economic Analyses Completed to Date of the
Most Promising Geopressed Energy Prospects in Louisiana

Author(s)- / Johnson , Adrain E., Jr. / Wrighton , Fred M. / Ray ,
Thomas G. /

Publisher- 4th Geopressed Geothermal Energy Conference

Publication date- Vol. 3, June 1980

Pagination- Page 1510 , 32 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Corporate Author- Louisiana State Univ.

Baton Rouge , USA

Auxiliary expression(s)-

Illus. / Graph (2) /

Table

Ref.

Descriptor(s)- / Comparative evaluations / Computerized simulation /
Cost / Data analysis / Economics / Exploitation / Geopressed

Geopressured Geothermal Bibliography

reservoirs / Louisiana / Methane / Reservoir properties /
Resource development / Site selection /

Abstract by Author

Five geopressured/geothermal prospects have been identified and described by W.J. Bernard in EVALUATION OF FIVE POTENTIAL GEOPRESSURE GEOTHERMAL TEST SITES IN SOUTHERN LOUISIANA. These five sites have been the subject of substantial analysis utilizing a techno-economic simulation model. A primary objective of this analytical work is to identify scenarios that would provide an environment conducive to the private development and exploitation of the resource. Consequently, the economics of the development of the resource have played a major role in our analyses. The base case for comparison of the sites to alternative investments has been established representing our best estimates of anticipated future investment, costs, and revenues under the existing regulatory, statutory, and institutional framework. The results of this base case analysis are reported for each site and the source of the differences identified. Scenarios in the form of recommended changes in the base case framework identified above are discussed and the economic sensitivity of changes in the framework identified.

23. GGIS-100407/O/ / /A/ / / / /

Title- A RPN Computer Solution of the James' Method of Metering Two Phase Flow

Author(s)- / Rudisill , Jacob M. / Skinner , Roy C. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 373 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

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95616

Local Availability- GGIS

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Computer calculations / Computer codes / Enthalpy /
Equations / Flow rate / Geothermal reservoirs / Geothermal wells
/ Numerical solution / Programming / Two phase flow / Well data /
Well testing /

Abstract by GGIS

The commonly used James method of gauging water dominated geothermal wells determines the flow rate of the well by an empirical relation between fluid enthalpy and critical lip discharge pressure. Modifications to the James trial and error

method of solving the enthalpy equation are presented in this paper: the modifications are packaged into a program written for the Hewlett-Packard programmable calculators. Using the program to solve the enthalpy equation results in far greater efficiency than solving by trial and error.

24. GGIS-100129/R/ / /M/ / / / /

Title- A Secondary Recovery Method for the Extraction of Geothermal Energy

Subtitle- Progress Report, July 1, 1975 - June 30, 1976

Author(s)- / Bodvarsson , Gunnar /

Publisher- ERDA

Washington, D. C.

Publication date- July 1976

Pagination- 87 Pages

Report/patent- RLO-2227-T21-1

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / ERDA

EY-76-S-06-2227-021 /

Corporate Author- Oregon State University

Corvallis , Oregon , USA

Auxiliary expression(s)-

Illus. / Diagram (9) / Graph (16) / Map (2) /
Table

Descriptor(s)- / Boreholes / Cost / Dike intrusions / Elasticity /
Flow rate / Fluid flow / Heat extraction / Heat flow / Thermal
conductivity /

Abstract by Author

The concept of forced geohat extraction involves an artificial circulation of water through natural fluid conducting structures in sufficiently hot rock. Several types of structures, viz., fault zones, dikes, formation contacts and sedimentary horizons are available for this purpose. The water is to be pumped into the structures through a series of relatively deep boreholes and will be recovered by other boreholes. The fluid conductivity may be of natural origin or be forced by a relatively high pumping pressure. The simplest situation is obtained when a fault zone or dike of high natural fluid conductivity is available in a favorable subsurface temperature environment. Relatively simple heat conduction theory is available to estimate the fluid/rock contact area required to absorb from a homogeneous temperature environment a given amount of heat during a given period of time. The theory can be extended to cases of a non-homogeneous initial temperature of the rock and time varying flow rates. The size of the contact area is the main criterion as to the realizability of forced geohat extraction systems. Of particular interest are systems that deliver heat for non-electrical uses in the Pacific Northwest. Theoretical considerations indicate that the contact areas required for an economical operation of such systems are not excessive and appear within the possibilities of present day technology.

25. GGIS-100407/O/ / /A/ / / / /

Title- A Simple Flow-meter for Use in Geothermal Wells

Author(s)- / Slatter , A. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 245 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasei W. Roberts

Available- Geothermal Resources Council

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95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (4) /

Descriptor(s)- / Equipment / Flow rate / Flowmeters / Fluid flow /

Hole diameter / Liquid flow / Measurement / Measuring

instruments / Measuring methods / Permeability / Velocity / Well

characteristics / Well data / Well logging / Well logging

equipment / Well testing /

Abstract by GGIS

Development of this geothermal well flow meter derives from the realization that the lack of a reliable, inexpensive and easily interpreted flow meter has resulted in this part of bore measurement and investigation being reliant upon deductions made from pressure and temperature logs. The real advantage of this flow meter is its simplicity, which gives an easy and inexpensive method for obtaining immediate surface readout. Briefly, the method consists of a spring balance which measures the impact of water flow on a circular plate which has been lowered downhole in a stepwise sequence. While this system does not have all the capabilities of an ideal flow meter, it is more advanced than what is currently available.

26. GGIS-100404/R/ / /M/ / / / /

Title- A Study of the Influential Leaders, Power Structure, Community Decisions, and Geothermal Energy Development in Imperial County, California

Author(s)- / Butler , Edgar W. / Pick , James B. /

Publication date- April 1980

Pagination- 30 Pages

Report/patent- UCRL-13991

Available- Technical Information Dept.

Lawrence Livermore Laboratory

University of California

Livermore
CA
94550
(Paper copy)
Local Availability- CES
Sponsor- / Department of Energy, Washington, D.C. (USA)
W-7405-ENG-48 /
Auxiliary expression(s)-
Table
Ref.
Descriptor(s)- / Agriculture / California / Communities / Economic
impact / Geothermal industry / Imperial County / Institutional
aspects / Local government / Management / Public opinion /
Regional analysis / Resource development / Socio-economic
factors / Sociology /

Abstract by Author

Social science research studies indicate that influential community leaders derive power from positions they hold and from personal attributes. The economy of Imperial County, California, is now dominated by agriculture, but economic studies indicate that the emerging geothermal sector could grow to a size comparable to that of agriculture. The current power structure is based on control derived from positions in agribusiness and government. If control of dominant economic resources is important to power and influence and if geothermal industry becomes as large a segment of the economy as agriculture, the power structure in Imperial County may change substantially. How will the power structure in Imperial County react to and be changed by geothermal development? The purpose of this study is to discover the kind of power structure operating in Imperial County, the influential leaders, the source of their power, their probable reactions to geothermal development, and the possible effects geothermal development will have on the power structure. Several social science research methods are used to identify the influential leaders and to describe the power structure in Imperial County. An analysis of the opinions of leadership and the public shows the likely response to geothermal development. The power structure analysis, combined with forecasts of the economic effects of geothermal development, indicates the ways in which the power structure itself may change.

27. GGIS-100995/ / / /A/ // //

**Title- A Study of Alternative Reinjection Schemes for the Cerro Prieto
Geothermal Field, Baja California, Mexico**

**Author(s)- / Tsang , Chin Fu / Bodvarsson , Gudmundur / Lippmann ,
Marcelo J. / Rivera R. , Jesus /**

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 659 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

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California

95616

Local Availability- CES

Geopressured Geothermal Bibliography

Auxiliary expression(s)-

Illus. / Figure (4) /

Table

Ref.

Descriptor(s)- / Cerro Prieto geothermal field / Flow models /
Geothermal brines / Hot water systems / Injection wells / Mexico
/ Producing wells / Waste water disposal / Well spacing /

Abstract by Author

Abstract by (Unknown)

In this paper the results of an initial study of possible reinjection patterns for the Cerro Prieto geothermal field, Baja California, Mexico are discussed. First, the numerical model and assumptions made are described, then the various cases studied are presented. The resulting data indicate what may be expected from different reinjection schemes and may provide useful guidelines for future reinjection operations at Cerro Prieto and other liquid-dominated geothermal fields.

28. GGIS-100143/R/ / /M/ / / / /

Title- A Study of Brine Treatment

Subtitle- Final Report, November 1977

Author(s)- / Phillips , Sidney L. / Mathur , Ashwani K. / Doebler ,
Raymond E. /

Publisher- Electric Power Research Institute
Palo Alto, California

Publication date- November 1977

Pagination- 256 Pages

Report/patent- EPRI ER-476

Sponsor- / ERDA

W-7405-ENG-48 /

Corporate Author- California University, Berkeley
Lawrence Berkeley Laboratories
Berkeley , California , USA

Auxiliary expression(s)-

Illus. / Diagram (6) / Graph (10) /

Table

Ref.

Descriptor(s)- / Bibliographies / Brine treatment / Calcite /
Corrosion / Corrosion protection / Corrosion resistance /
Descaling / Electric potential / PH adjustment / Silica /
Sulfides /

Abstract by Author

The objective of this project was to collect the available information pertinent to the treatment of geothermal brines by literature search and then evaluate and summarize this information for use by the electric utility and geothermal industry. The information used for this study was screened from the geothermal, oil and gas, wastewater disposal, and boiler water treatment industries. This information was evaluated and the current state of knowledge and methodology concerning the treatment of geothermal brines to control scaling and corrosion in geothermal electric power production was assessed. Currently, geothermal scale in pipes and wells is removed by physical or chemical methods. There is a growing effort on developing methods to control scale formation for both fresh and

spent brines, including PH adjustment and application of an electrical potential for fresh fluids, and coagulation to treat spent fluids. Current methods of corrosion control center around planned replacement of piping and other plant components, with efforts focused primarily on development of materials with improved corrosion resistance. Recommendations for additional work to improve brine treatment include the following: 1) chemical and physical characterization of brine and scale compositions, 2) basic data on the mechanism of scale formation and the effects of inhibitors, 3) development of instrumentation to monitor geothermal brine constituents, 4) correlation of laboratory results with field test data, 5) screening of currently available commercial inhibitors for application to geothermal brines.

29. GGIS-100407/0/ / /A/ / / / /

Title- A Study of Drawdown and Buildup Tests in Wells with Phase Boundaries

Author(s)- / Home , Roland N. / Satman , Abdurrahman /
Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
Salt Lake City
Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 345 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasel W. Roberts

Available- Geothermal Resources Council
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95616

Local Availability- GGIS

Sponsor- / California Univ., Berkeley (USA). Lawrence Berkeley Lab.
1673600 /

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (5) /

Ref.

Descriptor(s)- / Compressibility / Diffusivity / Equations / Field studies / Geothermal reservoirs / Hydraulic properties / Hydraulics / Injection / Numerical analysis / Permeability / Porosity / Pressure buildup / Pressure decline / Production / Reservoir properties / Two phase flow / Well testing /

Abstract by GGIS

Recognizing and analyzing the occurrence of concentric phase boundaries that appear in the vicinity of a well during testing assists in understanding the reservoir. This research considers the analysis of pressure transient tests in two-phase geothermal environments. Several situations have been identified in which radial discontinuity configuration can happen; conclusions drawn from research into these situations have disclosed that permeabilities may be found for both regions in the

Geopressured Geothermal Bibliography

configuration and that frequently, calculations may reveal the volume and porosity of the inner region.

30. GGIS-100165/R/ / /M/ / / / /

Title- A Technology Assessment of Geothermal Energy Resource Development

Author(s)- / Gordon , T. J. / Maslan , F. / Deitch , L. /

Publication date- April 15 , 1975

Pagination- 563 Pages

Report/patent- PB-246 241

Available- NTIS

(Paper copy)

(Microfiche)

Corporate Author- Futures Group

Glastonbury , Connecticut , USA

Descriptor(s)- / Computer programs / Computerized simulation / Cost estimates / Economic impact / Economics / Electric power generation / Environmental impacts / Exploration / Feasibility studies / Forecasting / Geothermal exploration / Geothermal resources / Geothermal systems / Hot dry rock systems / Hot water systems / Leasing / Legislation / Magma systems / Mathematical models / Regulations / Reviews / Social effect / Technology assessment / Computer codes / Cost / Environmental effects / Power generation / Simulation / Social impact /

Abstract by NTIS

Geothermal energy, energy derived from the intrinsic heat of the earth, may become an important element of the energy inventory of the United States and the world in the next few decades. The report deals with some potential uses of geothermal energy in the United States, evaluates systems and makes recommendations for future applications. Specifically the objectives of this study were to: (1) identify potential constraints to the development of geothermal power; (2) determine feasibility; (3) determine its social, political, economic and environmental impacts in this country; and (4) provide input to the policy process regarding geothermal energy.

31. GGIS-100002/O/ / / 3/A/ / / / /

Title- A Theory on the Effect of Overburden Stress on Geopressure Prediction from Well Logs

Author(s)- / Eaton , Ben A. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 3 , 1972

Pagination- Page 15 , 4 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Engineering geology / Geopressed reservoirs /
 Overburden pressure / Stress / Overburden / Effects /
 Geopressure / Prediction / Well logging / Petroleum /

 32. GGIS-100304/0/ / /A/ // //

Title- A Thermodynamic Power Cycle for Recovery of Geothermal Energy

Author(s)- / Howerton , M.T. /

Conference- 8th Intersociety Energy Conversion Engineering Conference
 Philadelphia

Pennsylvania

USA (August 13 , 1973)

Publisher- University of Pennsylvania

Philadelphia, Pennsylvania

Journal- Intersociety Energy Conversion Engineering Conference

Publication date- 1973

Pagination- Page 382 , 7 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Artificial recharge / Elevated temperature /
 Geothermal energy conversion / Heat exchangers / Power generation
 / Thermodynamic cycles / Working fluids /

Abstract by NSF-RANN

A thermodynamic cycle is described which can efficiently recover thermal energy from natural heat sources at depths ranging from 2500 feet to 50,000 feet. For a heat source at 700 DEG F, a thermodynamic efficiency of 20-25% can be achieved. The maximum thermodynamic cycle efficiency can be approached by utilizing a multicomponent working medium composed of a noncondensable gas and a condensable fluid. The working medium circulates in a closed loop and absorbs thermal energy in a heat exchanger located in a well bore at the depth of the heat source. A low-pressure vapor mixture from the power turbine exhaust is partially condensed and injected into the well bore as a two-phase mixture. Both the temperature and pressure of the working medium are increased by adiabatic compression of the noncondensable gas as the two-phase mixture descends to the depth of the heat source. The condensable fluid is vaporized in the exchanger and the working medium is returned to the surface as a single-phase superheated, vapor mixture. This high-temperature, high-pressure vapor mixture is expanded in the power turbine to complete the cycle.

 33. GGIS-100098/B/ / /M/ // //

Title- Abnormal Formation Pressures

Subtitle- Implications to Exploration, Drilling, and Production of Oil and Gas Resources

Author(s)- / Fertl , W. H. /

Publisher- Elsevier Science Publishing Co.

Amsterdam, Netherlands

Publication date- Issue 2 , 1976

Pagination- 382 Pages

Geopressed Geothermal Bibliography

Descriptor(s)- / Petroleum resources / Resources / Exploration /
Drilling / Production / Effects / Geopressure / Reservoir rocks /
Textbooks /

34. GGIS-100002/0/ / 3/A/ // //

Title- Abnormal High Pressure and Environment of Deposition

Author(s)- / Martin , Gene B. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 3 , 1972

Pagination- Page 51 , 5 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Texas / Oligocene / Sedimentation / Sedimentary
petrology / United States / Environment / Deposition / South /
Gulf Coast / Sandstone / Shale / Geopressed reservoirs /
Overburden pressure / Pressure buildup / Biostratigraphy /
Foraminifera / Paleoecology / Marine / Neritic / Geopressure /

35. GGIS-100002/0/ / 2/A/ // //

**Title- Abnormal Pressures and Potential Geothermal Resources in the
Rio Grande Embayment of Texas**

(Cenozoic Near Shore Marine and Deltaic Deposits, Saline Ground
Water, Geothermal Gradient)

Author(s)- / Wallace , Raymond H., Jr. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 2 , 1970

Pagination- Page 87 , 18 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Texas / Geothermal energy / Heat flow / Engineering
geology / Ground water / Cenozoic Era / Economic geology / United
States / Geopressed reservoirs / Connate water / Rio Grande
Embayment / Hidalgo County / Tabasco / Weslaco / Possibilities /
Geothermal gradient / Geopressure / Relation / Sediments /

36. GGIS-100002/0/ / 1/A/ // //

Title- Abnormal Pressures in South Louisiana

Author(s)- / Wells , E. C. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 1 , Issue 1 , 1967

Pagination- Page 19 , 4 Pages
 Descriptor(s)- / Louisiana / Economic geology / Petroleum / South /
 Gulf Coast / United States / Production / Geopressure /

37. GGIS-100024/B/ / 11/M/ / / / /

Title- Abnormal Subsurface Pressure

(Selected Papers from AAPG Bulletin)

Author(s)- / Dickinson , George B. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 11 , 1974

Pagination- 205 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Petroleum / Production / Reservoir rocks /
 Geopressure /

38. GGIS-100002/O/ / 3/A/ / / / /

Title- Abnormal Subsurface Pressures

Subtitle- Their Origin and Methods Employed for Prediction in India

Author(s)- / Sagay , Bhagman /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 3 , 1972

Pagination- Page 153 , 4 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / India / Engineering geology / Geopressured
 reservoirs / Overburden pressure / Pressure buildup /
 Geopressure / Origin / Prediction / Boreholes / Measuring
 methods / Asia /

39. GGIS-100029/J/ / 1802/A/ / / / /

Title- Abnormally High Formation Pressures

Original Title- Pressoes de Formacao Anormalmonte Altas

Author(s)- / Frank , M. R. /

Journal- Bol. Tec. Petrobras

Publication date- Vol. 18 , Issue 2

Pagination- Page 59 , 8 Pages

Language- Portuguese

Auxiliary expression(s)-

Sum.

Illus.

Descriptor(s)- / Sedimentation / Processes / Compaction / Migration /
 Pore water / Pore pressure / High pressure / Compression /
 Volcanism / Faults / Seals / Lateral / Vertical / Effects /
 Exploration / Petroleum / Formation pressure / Geopressure /

40. GGIS-100004/O/ / /M/ / / / /

Title- Abstracts

Conference- Development and Utilization of Geothermal Resources
Publication date- 1975

41. GGIS-100048/J/ / 1903/A/ / / / /

Title- Abyssal Heat Flow in Oil and Gas-Bearing Continental Structures

Author(s)- / Makarenko , F. A. / Sergiyenko , S. I. /

Journal- Int. Geol. Rev.

Publication date- Vol. 3 , 1975

Pagination- Page 249 , 7 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Heat flow / Crust / Organic Materials / Petroleum /
USSR / Geothermal gradient / Hydrocarbons / Tectonophysics /
Distribution / Patterns / Effects / Origin / Migration / Urals /
Volga River / Oil and gas fields / Relation / Geopressure / P-T
conditions / Piedmont /

42. GGIS-100528/O/ / /A/ / / / /

Title- Accurate Determination of Geopressured Aquifer Salinity from the SP Log

Author(s)- / Silva , Pedro / Bassiouni , Zaki /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 193 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (9) /

Table

Ref.

Descriptor(s)- / Aquifers / Dissolved gases / Equations /
Geopressured zones / Louisiana / Salinity / Sp logging / Well
logging /

Abstract by GGIS

The amount of dissolved gas contained in geopressured brine is dependent upon the water salinity. When water samples from a geopressured aquifer are unavailable, the method of determining water salinity is by estimation using conventional well logging interpretation. The customary method is to calculate the water resistivity from the SP log, and use available correlations to get the water salinity. The authors have devised a new method of relating SP to the resistivity of the shale, water, and mud filtrate which has resulted in a significant improvement in the correlation between water salinity values estimated from the SP log and water salinity values taken from actual water samples.

43. GGIS-100589/B/ / /M/ / / / /

Title- Acoustic Log-Porosity Corrections Associated With Compaction Pattern, Texas Gulf Coast Basin

Author(s)- / Hyan , I. /

Publication date- 1977

Pagination- 151 Pages

Available- Univ. Microfilms

Descriptor(s)- / Acoustic monitoring / Compaction / Gulf Coast / Ocean basins / Sonic logging /

44. GGIS-100995/ / / /A/ / / / /

Title- Acoustic Sensor Development for Geothermal Borehole Televiewer

Author(s)- / Wonn , J.W. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 735 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (6) /

Descriptor(s)- / Acoustic monitoring / Boreholes / Geothermal wells / Measuring instruments / Sonic logging / Well logging /

Abstract by Author (rev.)

Westinghouse is currently under contract to develop a geothermal borehole televiewer sensor. Environmental design goals are operation at 275 DEG C (525 DEG F) and 7000 PSI and sufficient tolerance to the corrosive borehole fluid. The primary project objective is to demonstrate the operation of the sensor under simulated geothermal borehole conditions. Results from screening tests and non-acoustic sensor tests indicate that suitable materials, components, and construction methods are available for achieving that goal. Confidence is sufficiently high to permit preliminary design of the acoustic sensor test apparatus.

45. GGIS-100439/R/ / /M/ / / / /

Title- Advanced Design and Economic Considerations for Commercial Geothermal Power Plants at Heber and Niland, California

Subtitle- Final Report

Publication date- October 1977

Pagination- 194 Pages

Report/patent- SAN/1124-2

Available- NTIS

(Paper copy)

(Microfiche)

Geopressured Geothermal Bibliography

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
Geothermal Energy
EY-76-C-03-1124 /

Corporate Author- Bechtel Corp.
San Francisco , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (13) / Graph (19) / Map (2) /
Table

Ref.

Descriptor(s)- / California / Commercialization / Comparative
evaluations. / Computerized simulation / Cost / Design /
Economics / Flashed steam systems / Geothermal power plants / Hot
water systems / Performance / Temperature dependence /

Abstract by Author (rev.)

Two separate studies, involving advanced design and economic considerations for commercial geothermal power plants using liquid-dominated hydrothermal resources, are presented in this report. In the first study, the effects on design, capital cost, and bus bar electric energy production cost caused by an anticipated decline in available geothermal fluid temperature over the lifetime of power plants are described. A two-stage, flashed-steam energy conversion process was used for the conceptual design of the power plants, which operate from the moderate temperature, low-salinity reservoir at Heber, California. Plants with net capacities of 50, 100, and 200 MWe (net) were investigated. The larger plant capacities require increased brine withdrawal rates from the reservoir and result in steeper brine temperature decline curves. These curves were calculated using a reservoir computer model. The results show that it is important to include provision for geothermal fluid temperature decline in the design of power plants to prevent loss of electric energy production capability and to reduce bus bar electric costs. In the second study, the technical, economic, and environmental effects of adding regeneration to a 50 MWe (net) power plant employing the multistage-flash/binary process are described. This plant operates from the high temperature, high salinity resources at Niland, California. Regeneration is potentially attractive, because it recovers waste heat from the turbine exhaust and uses it in the power cycle. However, the pressure drop caused by the introduction of the regenerator decreases the turbine expansion and thus decreases system performance. An innovative approach was taken in the design of the regenerator, which minimized the expected performance degradation of the turbine. The result was that the performance, capital cost, and bus bar electric energy production cost are nearly the same for the processes with and without regeneration. On the other hand, the addition of regeneration has the environmental benefits of substantially reducing heat rejection to the atmosphere and cooling tower makeup and blowdown water requirements. It also increases the temperature of the brine returned to the field for reinjection.

46. GGIS-100995/ / / /A/ / / / /

Title- Advanced Turbodrills for Geothermal Wells

Author(s)- / Maurer , William C. / Rowley , John C. / Carwile , Clifton /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 411 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (4) / Photo (1) /

Ref.

Descriptor(s)- / Directional drilling / Drilling equipment / Elevated temperature / Geothermal wells / Well drilling /

Abstract by Author

Maurer Engineering Inc. is continuing the development of a new high-temperature, 350 DEG C advanced turbodrill for use in drilling geothermal wells. Existing downhole drilling motors are temperature limited because of elastomeric degradation at elevated temperature. The new turbodrill contains high-torque turbine blades and improved seals which allow higher bit pressure drops. This new geothermal turbodrill which is designed for improved directional drilling offers economic alternatives for completing geothermal wells.

47. GGIS-100302/J/ / /A/ // //

Title- Alcohol Fuel Production Using Geothermal Energy

Author(s)- / Lund , John W. /

Journal- Q. Bull., Geo-Heat Util. Cent.

Publication date- Vol. 4 , Issue 4 , October 1979

Pagination- Page 12 , 7 Pages

Auxiliary expression(s)-

Illus. / Figure (1) / Graph (1) /

Table

Ref.

Descriptor(s)- / Economics / Geothermal energy / Geothermal space heating / Low temperature / Moderate temperature / Process heating / Uses /

Abstract by Author (rev.)

Geothermal energy is a renewable resource that could make a significant impact in alcohol fuel production. One of the problems with alcohol production is that it is very energy intensive. The required energy input for production will vary from 40,000 to 70,000 BTU's per gallon of alcohol produced, depending upon the degree of heat recovery achieved in the design of the distillery. On the average, the energy input in a plant amounts to about half of the new energy output available in the alcohol. This input includes not only the fuel oil, natural gas, or waste material supplying the heat, but also electrical energy to run motors, pumps, etc. Since lower temperature geothermal resources (below 300 DEG F) are suited for process heating and space heating, and can be adapted for the production of alcohol, use of these resources can contribute to reducing the need for fossil fuels in producing alcohol. Other advantages of using

Geopressured Geothermal Bibliography

geothermal energy include the lack of combustion air pollutants, the availability of hot springs and shallow low-temperature wells in rural areas where the raw products are also available, and the use of the "waste" geothermal energy for drying the protein by-product.

48. GGIS-100407/O/ / /A/ / / / /

Title- Alcohol Production

Subtitle- An Appropriate Use of Hydrothermal Energy

Author(s)- / Stiger , Robert R. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 621 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (1) /

Ref.

Descriptor(s)- / Agriculture / Biomass / Calculations / Cost /
Economics / Efficiency / Feasibility studies / Geothermal energy
/ Geothermal energy conversion / Geothermal fluids / Idaho /
Production / Raft River KGRA / Synthetic fuels /

Abstract by GGIS

The argument is presented that hydrothermal energy is appropriate for use in alcohol production. Support for the argument comprises specific examples that show: that commercial technology makes feasible the conversion of a non-portable energy source to a portable resource; that hydrothermal resource temperatures are suitable for alcohol production; that an abundance of hydrothermal energy is available; that hydrothermal energy used for alcohol production is both cost and energy efficient.

49. GGIS-100407/O/ / /A/ / / / /

Title- Alternate Energy Investment Decision Modelling

Subtitle- The Case of Geopressured Geothermal Investment Decisions

Author(s)- / Prestwood , Donna C.L. / Duffy , JoAnn M. / Stone ,
Michael / Vanston , John H. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City
 Utah
 USA (September 9 , 1980)
 Publisher- Geothermal Resources Council
 Davis, CA
 Publication date- Vol. 4 , 1980
 Pagination- 3 Pages
 Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasei W. Roberts
 Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 CA
 95616
 Local Availability- GGIS
 Auxiliary expression(s)-
 Illus. / Diagram (2) /
 Ref.
 Descriptor(s)- / Development / Economic analysis / Economics /
 Exploitation / Financial incentives / Geopressure resources /
 Gulf Coast / Investment / Louisiana / Management / Models /
 Public utilities / Texas /
 Abstract by GGIS

In general, using a decision model clarifies and simplifies the decision making process. This decision modelling project team sought to include both economic and non-economic criteria in their model, a comprehensive model that would accurately reflect the process a firm would use in deciding whether to enter a geopressured geothermal energy venture. This paper focuses on the qualitative factors that affect investment decision making; the qualitative process is used in conjunction with the economic decision model being developed. The qualitative decision analysis is divided into two parts, the first being a description of the decision modelling process, and the second being the identification of the decision factors.

 50. GGIS-100058/J/ / /A/ / / / /

Title- Alternate Fuels

Publication date- Vol. 78 , Issue 1 , January 7 , 1980
 Pagination- Page 50 , 1 Pages
 Local Availability- CES
 Descriptor(s)- / Cameron Parish / Drilling / Geopressure exploration
 / Geopressure wells / Louisiana /
 Abstract by PROMPT

DOE and Magma Gulf/Technadril have signed an \$8.9 million contract to drill and test a geopressured geothermal well in Cameron Parish, Louisiana. The project objective is to evaluate the reservoir and its long-term productivity capacity and, after testing, to demonstrate that a geopressured geothermal well can be operated commercially.

 51. GGIS-100590/R/ / /M/ / / / /

Geopressed Geothermal Bibliography

Title- Alternative Gas Workshop

(Final Report)

Author(s)- / Cremer , G. /

Publication date- March 1980

Pagination- 58 Pages

Report/patent- CONF-7909133

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-36 /

Corporate Author- Los Alamos Scientific Lab

NM , USA

Descriptor(s)- / Brines / Gases / Geothermal brines / Information
needs / Methane / Recommendations / Research programs /

Abstract by NTIS

The Alternative Gas Workshop met at the Los Alamos Scientific Laboratory on September 5 and 6, 1979, to review basic research needs in the development of seven categories of unconventional and nonconventional gas resources. The categories reviewed were: Devonian shales, western tight gas sands, methane from coal beds, geopressed brines, methane hydrates, abiogenic methane, and other geological environments. This report presents the principal recommendations of the workshop groups.

52. GGIS-100333/R/ / /M/ // //

Title- Alternative Gas Workshop

Subtitle- Final Report

Author(s)- / Cremer , Glenda /

Conference- Alternative Gas Workshop

Los Alamos

New Mexico

USA (September 5 , 1979)

Publication date- March 1980

Pagination- 51 Pages

Report/patent- LA-8155-C

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

W-7405-ENG-36 /

Corporate Author- Los Alamos Scientific Lab.

Los Alamos , New Mexico , USA

Auxiliary expression(s)-

Illus. / Figure (7) / Diagram (6) / Map (2) / Graph (5) / Photo (1) /

Table

Ref.

Descriptor(s)- / Energy source development / Economics / Geopressed
reservoirs / Geopressed wells / Louisiana / Meetings / Methane
/ Natural gas / Research programs / Texas /

Abstract by Author

The Alternative Gas Workshop met at the Los Alamos Scientific Laboratory on September 5 and 6, 1979, to review basic research needs in the development of seven categories of unconventional

and nonconventional gas resources. The categories reviewed were Devonian shales, western tight gas sands, methane from coal beds, geopressured brines, methane hydrates, abiogenic methane, and other geological environments. This report presents the principal recommendations of the workshop groups.

53. GGIS-100484/G/ / /C/ / / / /

Title- Altitude of the Base of the Maximum-Salinity Zone (Calculated as NaCl in the Lower Rio Grande Embayment, Texas
(Plate 7)

Conference- Third Geopressured-Geothermal Energy Conference
Lafayette
LA (November 16 , 1977)

Pagination- 1 Pages

Note- Hydrogeology by R.E. Taylor

Local Availability- GGIS

Corporate Author- Department of the Interior
United States Geological Survey

Descriptor(s)- / Altitude / Cameron County / Contour maps / Faults /
Geologic structures / Geopressured zones / Hidalgo County /
Hydrogeology / Kenedy County / Maps / Rio Grande Embayment /
Salinity / Texas / Willacy County /

Abstract by GGIS

The altitude of the base of the maximum salinity zone (calculated as NaCl) in the Lower Rio Grande Embayment (Texas) is shown on this map. Contour lines of equal altitude show indicated maximum salinity. Salinity control was selected from well control data available through 1976. Color coded shading shows the altitude in feet. Faults are shown for the purpose of structural reference. The scale of the map is 1:192,000.

54. GGIS-100479/G/ / /C/ / / / /

Title- Altitude of the Surface of the 0.7-Pounds Per Square Inch Per Foot Fluid-Pressure Gradient in the Lower Rio Grande Embayment, Texas
(Plate 2)

Conference- Third Geopressured-Geothermal Energy Conference
Lafayette
LA (November 16 , 1977)

Pagination- 1 Pages

Note- Hydrogeology by J.B. Wesselman

Local Availability- GGIS

Corporate Author- Department of the Interior
United States Geological Survey

Descriptor(s)- / Altitude / Cameron County / Contour maps / Faults /
Fluid pressure / Geologic structures / Geopressured zones /
Hidalgo County / Hydrogeology / Kenedy County / Maps / Rio Grande
Embayment / Texas / Willacy County /

Abstract by GGIS

The altitude of the surface of the .7 psi/ft. fluid pressure gradient in the Lower Rio Grande Embayment, Texas, is indicated on this map. Contour lines show the lines of equal altitude of

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the indicated pressure-gradient surface, and color coding of the area allows recognition of the altitude. Faults are shown for structural reference. The scale of the map is 1:192,000.

55. GGIS-100486/G/ / /C/ / / / /

Title- Altitude of the Top of the Deepest Zone With a Calculated Salinity of 20 Grams Per Liter or Less NaCl in the Lower Rio Grande Embayment, Texas
(Plate 9)

Conference- Third Geopressured-Geothermal Energy Conference
Lafayette

LA (November 16 , 1977)

Pagination- 1 Pages

Note- Hydrology by R.E. Taylor

Local Availability- GGIS

Corporate Author- Department of the Interior

United States Geological Survey

Descriptor(s)- / Altitude / Cameron County / Contour maps / Faults /
Geologic structures / Geopressured zones / Hidalgo County /
Hydrogeology / Kenedy County / Maps / Rio Grande Embayment /
Salinity / Texas / Willacy County /

Abstract by GGIS

The altitude of the top of the deepest zone with a calculated salinity of 20 grams/liter or less NaCl in the Lower Rio Grande Embayment (Texas) is shown on this map. The salinity control has been selected from well control data available through 1976. Contour lines show equal altitudes of the indicated salinity. Color coded shading shows the altitude in feet. The scale of the map is 1:192,000.

56. GGIS-100485/G/ / /C/ / / / /

Title- Altitude of the Top of the Deepest Zone With a Calculated Salinity of 25 Grams Per Liter or Less NaCl in the Lower Rio Grande Embayment, Texas
(Plate 8)

Conference- Third Geopressured-Geothermal Energy Conference
Lafayette

LA (November 16 , 1977)

Pagination- 1 Pages

Note- Hydrogeology by R.E. Taylor

Local Availability- GGIS

Corporate Author- Department of the Interior

United States Geological Survey

Descriptor(s)- / Altitude / Cameron County / Contour maps / Faults /
Geologic structures / Geopressured zones / Hidalgo County /
Hydrogeology / Kenedy County / Maps / Rio Grande Embayment /
Salinity / Texas / Willacy County /

Abstract by GGIS

The altitude of the top of the deepest zone with a calculated salinity of 25 grams/liter or less NaCl in the Lower Rio Grande Embayment (Texas) is shown on this map. Salinity control was selected from well control data available through 1976. Color

coded shading shows the altitude in feet. Faults are shown for structural reference. The scale of the map is 1:192,000.

57. GGIS-100480/G/ / /C/ / / / /

Title- Altitude of the 158 DEG F Geothermal Surface in the Lower Rio Grande Embayment, Texas
(Plate 3)

Conference- Third Geopressured-Geothermal Energy Conference
Lafayette
LA (November 16 , 1977)

Pagination- 1 Pages

Note- Hydrogeology by R.H. Wallace, Jr.

Local Availability- GGIS

Corporate Author- Department of the Interior
United States Geological Survey

Descriptor(s)- / Altitude / Cameron County / Contour maps / Faults /
Geologic structures / Geopressured zones / Hidalgo County /
Hydrogeology / Kenedy County / Maps / Rio Grande Embayment /
Texas / Willacy County /

Abstract by GGIS

The altitude of the 158 deg F geothermal surface of the Lower Rio Grande Embayment, Texas, is shown on this map. Contour lines show the equal altitude of the indicated temperature, and color-coded shading shows the altitude in feet. Faults are indicated for structural reference. The scale of the map is 1:192,000.

58. GGIS-100481/G/ / /C/ / / / /

Title- Altitude of the 212 DEG F Geothermal Surface in the Lower Rio Grande Embayment, Texas
(Plate 4)

Conference- Thrid Geopressured-Geothermal Energy conference
Lafayette
LA (November 16 , 1977)

Pagination- 1 Pages

Note- Hydrogeology by R.H. Wallace, Jr.

Local Availability- GGIS

Corporate Author- Department of the Interior
United States Geological Survey

Descriptor(s)- / Altitude / Cameron County / Contour maps / Faults /
Geologic structures / Geopressured zones / Hidalgo County /
Hydrogeology / Kenedy County / Maps / Rio Grande Embayment /
Temperature distribution / Temperature measurement / Texas /
Willacy County /

Abstract by GGIS

The altitude of the 212 deg F geothermal surface in the Lower Rio Grande Embayment, Texas, is shown on this map. Contour lines show the equal altitude of the indicated temperature, and color-coded shading shows the altitude in feet. Faults are indicated for structural reference. The scale of the map is 1:192,000.

59. GGIS-100482/G/ / /C/ / / / /

Title- Altitude of the 248 DEG F Geothermal Surface in the Lower Rio Grande Embayment, Texas

(Plate 5)

Conference- Third Geopressured-Geothermal Energy Conference

Lafayette

LA (November 16 , 1977)

Pagination- 1 Pages

Note- Hydrogeology by R.H. Wallace, Jr.

Local Availability- GGIS

Corporate Author- Department of the Interior

United States Geological Survey

Descriptor(s)- / Altitude / Contour maps / Faults / Geologic structures / Geothermal resources / Hydrogeology / Maps / Rio Grande Embayment / Temperature measurement / Texas /

Abstract by GGIS

The altitude of the 248 deg F geothermal surface in the Lower Rio Grande Embayment (Texas) is shown on this map. Temperature control was selected from well control data available through 1976. Color-coded shading shows the altitude and contour lines show equal altitude of the indicated temperatures. Faults are shown for structural reference. The scale of the map is 1:192,000.

60. GGIS-100483/G/ / /C/ / / / /

Title- Altitude of the 302 DEG F Geothermal Surface in the Lower Rio Grande Embayment, Texas

(Plate 6)

Conference- Third Geopressured-Geothermal Energy Conference

Lafayette

LA (November 16 , 1977)

Pagination- 1 Pages

Note- Hydrogeology by R.H. Wallace, Jr.

Local Availability- GGIS

Corporate Author- Department of the Interior

United States Geological Survey

Descriptor(s)- / Altitude / Cameron County / Contour maps / Faults / Geologic structures / Geothermal resources / Hidalgo County / Hydrogeology / Kenedy County / Maps / Rio Grande Embayment / Temperature measurement / Texas / Willacy County /

Abstract by GGIS

The altitude of the 302 deg F geothermal surface in the Lower Rio Grande Embayment (Texas) is shown on this map. Temperature control was chosen from well control data available through 1976. Contour lines represent equal altitude of indicated temperatures, and color-coded shading indicates the altitude. Faults are shown for structural reference. The scale of the map is 1:192,000.

61. GGIS-100133/R/ / /M/ / / / /

Title- An Analysis of the Bipole-Dipole Resistivity Method for Geothermal Exploration

Author(s)- / Dey , Abhijit / Morrison , H. F. /

Publication date- June 1977

Pagination- 63 Pages

Report/patent- LBL-6332

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / ERDA

W-7405-ENG-48 /

Corporate Author- California University, Berkeley

Lawrence Berkeley Laboratories

Berkeley , California , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (34) /

Ref.

Descriptor(s)- / Depth / Electric conductivity / Geothermal exploration / Overburden / Resistivity surveys / Simulation / Structural models /

Abstract by Author

Bipole-Dipole (B-D) resistivity mapping has been widely used as a reconnaissance method in geothermal exploration. In this technique, apparent resistivities are plotted at roving dipole receiver locations and the current source (bipole) is left fixed. Interpretation to date has been in terms of simple layered, dike, vertical contact, or sphere models. In the case of more complicated two-dimensional models the interpretation is much more ambiguous and the detection of buried conductors depends very much on the choice of transmitter location. Since apparent resistivities taken on a line collinear with the bipole are roughly equivalent to the apparent resistivities for one sounding in a dipole-dipole (D-D) pseudo-section, the two methods have been compared for several two-dimensional models. A buried quarter space and a buried horizontal block of rectangular cross section, with or without an overburden layer, have been used in the comparison. Unless the target is very shallow or close to the bipole or dipole, the resolution of the horizontal position or depth extent for the B-D method is very poor. Conductive overburden worsens the situation for both methods but the effect is more drastic for the B-D method. The spatial patterns for these models is complex for the B-D method and in fact for certain transmitter positions only subtle differences exist for the buried block and buried quarter space models. Multiple sources improve the resolution of the B-D method, but many sources coupled with the high sampling density of receivers required to define the spatial patterns would greatly reduce the cost effectiveness claimed for this method. Changing the bipole orientation with respect to the strike of the models contributes little if anything to the resolution of the models. A further experiment of calculating a residual map by subtracting the half-space or layered half-space response from the response of the buried models was also unsuccessful in improving the interpretability of the B-D method. Finally, a

Geopressured Geothermal Bibliography

model representative of a typical basin-and-range valley with and without a hypothesized geothermal map would not, in a practical survey, reveal the reservoir. From these model studies it is clear that, except for some simple geological situations, the B-D method is not effective for subsurface mapping. Selected D-D lines would be far more useful and more cost effective.

62. GGIS-100407/O/ / /A/ / / / /

Title- An Analysis of Benefits and Costs of Accelerated Market Penetration by a Geothermal Community Heating System

Author(s)- / Barron , William / Dubin , Robin / Kane , Sally /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 699 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project Manager: Vasei W. Roberts

Available- Geothermal Resources Council

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Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy /

Auxiliary expression(s)-

Illus. / Graph (3) /

Table

Ref.

Descriptor(s)- / Capital / Commercialization / Computer codes / Conversion / Cost / Cost benefit analysis / District heating / Economics / Equations / Feasibility studies / Financial incentives / Fuels / Geothermal energy / Geothermal heating / Geothermal industry / Income / Market / Optimization / Profits / Public utilities /

Abstract by GGIS

The rate of market penetration within a community heating system's service area is influenced by two cost factors: capital (fixed) costs; and fuel (variable) costs. Capital costs may prevent widespread introduction of geothermal community heating systems. Costs associated with geothermal heating are compared with conventional fuel heating system costs, and incentive plans for geothermal heating systems are evaluated.

63. GGIS-100356/ / / /M/ / / / /

Title- An Analysis of Ecological Effects of Geopressured-Geothermal Resource Development
(Geopressured Geothermal Technical Paper No. 4)

Publication date- July 1979

Report/patent- DOE/ET/28464-1(vol. 4)

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Department of Energy

ET-78-G-05-5958 /

Corporate Author- RPC, Inc.

Austin , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (4) /

Table

Ref.

Descriptor(s)- / Air pollution / Energy source development / Energy policy / Environmental effects / Fault activation / Geopressured reservoirs / Geothermal brines / Ground subsidence / Gulf coast / Seismicity / Texas / Waste disposal / Water pollution /

Abstract by Author

This report identifies the activities involved in geopressured-geothermal resource production and discusses their ecological impacts. The analysis separates those activities that are unique to geopressured-geothermal development from those that also occur in oil and gas and other resource developments. Of the unique activities, those with the greatest potential for serious ecological effect are: (1) accidental brine discharge as a result of a blowout during well drilling; (2) subsidence; (3) fault activation and enhanced seismicity; and (4) subsurface contamination of water, hydrocarbon, and mineral reservoirs. Available methods to predict and control these effects are discussed. In virtually every aspect of the study, however, information specific to Texas geothermal resource development was found to be inadequate. The analysis provided here should be refined as more Texas-specific geothermal resource data and experience become available. In addition, each geothermal resource production site will contain features that must be considered in a case-by-case assessment.

64. GGIS-100393/0/ / /A/ / / / /

Title- An Analysis of Reservoir Mechanics of Geopressured Geothermal Aquifers

Subtitle- The Brazoria County Prospect

Author(s)- / Ohkuma , Hiroshi / Sepehrnoori , Kamy / Lewis , John T. / Lewis , John T. / Knapp , Roy M. / McDonald , Robert C. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 2 , June 1980

Pagination- Page 907 , 25 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS

Austin

TX

Geopressured Geothermal Bibliography

78712
(Paper copy)
Local Availability- CES
Auxiliary expression(s)-
Illus. / Diagram (1) / Graph (9) /
Table
Ref.
Descriptor(s)- / Aquifers / Brazoria County / Compaction / Dissolved
gases / Gas saturation / Geopressured reservoirs / Geothermal
brines / Models / Permeability / Pleasant Bayou No. 2 Well /
Productivity / Reservoir engineering / Simulation / Systems
analysis / Texas /

Abstract By Author

Aquifers of abnormally high pressures, known as "geopressured geothermal aquifers," are found extensively in the Gulf Coast Region of the United States. The hot water contained in the aquifers may have a significant amount of dissolved hydrocarbon gas. A two-phase, two-dimensional simulator using a finite difference technique was developed for simulating the production behavior of these geopressured aquifers. A series of cross-sectional model calculations were performed to analyze reservoir mechanics operative in a geopressured aquifer. Investigated are the effects of reservoir heterogeneities and completion strategies on resource recovery. Finally, an assessment is made of the effects of gas evolution about the wellbore on well productivity.

65. GGIS-100424/O/ / /A/ / / / /

Title- An Analysis of Reservoir Mechanics of Geopressured Geothermal Aquifers

Author(s)- / Okhuma , Hiroshi / Knapp , Roy M. / Sepehrnoori , Kamy /
Conference- Geothermal Resources Council 3rd Annual Meeting Trans.
(Expanding the Geothermal Frontier)

Reno

Nevada

USA (September 24 , 1979)

Publication date- Vol. 3 , 1979

Pagination- Page 511 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Corporate Author- Texas Univ.

Austin , USA

Auxiliary expression(s)-

Illus. / Graph (4) /

Table

Ref.

Descriptor(s)- / Aquifers / Compaction / Dissolved gases / Fluid
withdrawal / Geopressured reservoirs / Mathematical models /
Reservoir engineering / Reservoir pressure / Water influx /

Abstract by Energyline

A two-phase two-dimensional simulator using finite
difference techniques was used for a series of areal and

cross-sectional model calculations to analyze reservoir mechanics operative in a geopressured aquifer. Important driving forces of reservoir mechanisms associated with fluid withdrawal are: reservoir fluid expansion; formation compaction; shale water influx; and evolution of dissolved gas. Calculations indicate that formation compaction is the driving energy of prime importance and that dewatering of interbedded shale layers appears to have appreciable effects on aquifer pressure performance.

66. GGIS-100308/O/ / /A/ / / / /

Title- An Approach to Risk Analysis for Government-Sponsored Demonstration Projects

Author(s)- / Dhillon , H. / El-Sawy , A. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 153 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Mitre Corp.

METREK Div.

McLean , Virginia , USA

Auxiliary expression(s)-

Illus. / Figure (15) / Graph (2) /

Table

Ref.

Appendix

Descriptor(s)- / Commercialization / Demonstration plants /
Demonstration programs / Economics / Electric power / Geothermal
power plants / Investment / Risk investment /

Abstract by Author

This paper analyzes the economics of geothermal power plant demonstration from the view points of the government and the private industry organizations participating in these demonstrations. The analysis presented focuses on electric power plants only, and a similar approach can be adopted for evaluating the demonstrations of direct-utilization alternatives.

67. GGIS-100408/R/ / /M/ / / / /

Title- An Assessment of Geothermal Development in the Imperial Valley of California

Subtitle- Volume 2--Environmental Control Technology

Geopressured Geothermal Bibliography

Publication date- Vol. 2 , July 1980

Pagination- 120 Pages

Report/patent- DOE/EV-0092

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C. (USA). Office of
Environmental Compliance and Overview
W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Livermore Lab.

Livermore , USA

Auxiliary expression(s)-

Illus. / Diagram (17) / Graph (6) / Map (2) /
Table

Descriptor(s)- / Air pollution abatement / California / Energy source
development / Geothermal power plants / Geothermal resources /
Hydrogen sulfides / Imperial Valley / Injection / Land pollution
abatement / Liquid wastes / Noise pollution abatement /
Seismicity / Solid wastes / Waste disposal / Water pollution
abatement /

Abstract by Author

Environmental control technologies are essential elements to be included in the overall design of Imperial Valley geothermal power systems. This report assesses environmental controls applicable to abatement of hydrogen sulfide emissions, cooling tower drift, noise, liquid and solid wastes, and induced subsidence and seismicity. Several currently available and emerging H₂S abatement technologies are applicable to power systems contemplated for the Imperial Valley. For optimum abatement of H₂S under a variety of plant operating conditions, removal of H₂S upstream of the steam turbine is recommended. The environmental impact of cooling tower drift will be closely tied to the quality of cooling water supplies. Although significant technological progress has been achieved in reducing drift emissions, the efficiency of drift eliminators may be rapidly degraded if low quality water supplies are used. Noise emission is not expected to be an important environmental issue in the Imperial Valley and strong community reaction is not anticipated. Conventional noise abatement procedures can be applied and no special research and development are needed. Injection technology constitutes the primary and most essential environmental control and liquid waste disposal technology for Imperial Valley geothermal operations. Potentially large volumes of solid wastes may be generated requiring efficient methods for handling and hauling due to limited land availability for on-site, interim waste storage. Subsurface injection of fluids is the primary control for managing induced subsidence. Careful maintenance of injection pressure is expected to control induced seismicity. Precise monitoring of surface elevations and the volumes of production and injection fluids are essential to provide useful data for making decisions regarding required subsidence and seismicity controls in the Imperial Valley.

68. GGIS-100162/B/ / /M/ / / / /

**Title- An Attitudinal Survey of Citizens in a Potential Gulf Coast
Geopressured-Geothermal Test-Well Locality**

(Research Report No. 9)

Subtitle- Final Report

Author(s)- / Lopreato , Sally Cook / Blissett , Marlan /

Publication date- May 1977

Pagination- 116 Pages

Available- Center for Energy Studies

Engineering Science Bldg. 143

University of Texas at Austin

Austin

Texas

78712

(Paper copy)

Sponsor- / ERDA /

Corporate Author- Texas University, Austin

Center for Energy Studies

Austin , Texas , USA

Auxiliary expression(s)-

Illus. / Map (1) /

Ref.

Table

Descriptor(s)- / Public opinion / Brazoria County / Communities /

Geothermal industry / Human populations / Public relations /

Recommendations / Regional analysis / Social impact /

Socio-economic factors /

Abstract by Energy Studies

Energy resource development projects have great potential value for particular regions and for the country as a whole, but such projects often bring problems to the small communities near which they occur. Yet, the needs and attitudes of local citizens are frequently ignored. This study entailed collection of attitudinal data, both from the general public and from representatives of various local sectors such as government, agriculture, and finance, in a potential Gulf Coast geopressured- geothermal test well locality, Brazoria and Galveston Counties. The results show that citizens are positively inclined toward energy development in their area, even though they are not yet well informed about the geopressured-geothermal resource. Satisfaction with community life is high, although some communities in the area already are experiencing difficulties with some public services. A strong sentiment was evidenced for local control of community affairs, even though outside advice and funding are viewed as necessary in meeting community needs under conditions of rapid growth. The report recommends that a more active program be pursued for the dissemination of information about the pending geothermal development, that community planning for growth be encouraged, and that federal and state assistance programs be better coordinated and streamlined. Various channels for communication within the community setting are discussed.

69. GGIS-100528/O/ / /A/ / / / /

Title- An Economic Evaluation of the Pleasant Bayou Design Well
(Addendum)

Author(s)- / Wrighton , Fred / Johnson , Adrian E. / Abdulrahman , Adnan /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- 19 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (8) /

Table

Ref.

Descriptor(s)- / Cost / Economics / Geopressure resources / Louisiana / Mathematical models / Pleasant Bayou No. 1 Well / Texas /

Abstract by GGIS

Formations in Brazoria County, Texas have been studied and the several geopressured sand facies have been designated as A, B, C, D, E, and F. Studies of simulated well production from sand "E" are reviewed. Results of the adjustment of the model to simulate sand "C" is presented with an economic evaluation. Further considerations propose sequential production of sands "C" and "E", and is evaluated both in terms of economics and sensitivity to sand characteristics.

70. GGIS-100528/O/ / /A/ / / / /

Title- An Economic Overview of Geopressured Solution Gas

Author(s)- / Wrighton , Fred /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 45 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-81NV10174 /

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Charges / Commercialization / Comparative evaluations / Cost benefit analysis / Dissolved gases / Economics / Geopressure resources /

Abstract by Author

Studies conducted over the last six years which include an economic evaluation of the geopressured geothermal resource are reviewed. Generalizations about the results of these studies given the difficulties of comparing them are presented. Sources of the recent pessimism about the commercialization of geopressured gas are considered along with the competitive alternative, gas produced from formations that are deeper than

15,000 feet. A proper perspective on geopressed gas is then suggested.

71. GGIS-100002/O/ / 2/A/ // //

Title- An Engineering Interpretation of Seismic Data
(Techniques, Texas Gulf Coast)

Author(s)- / Pennebaker , E. S. /
Conference- Abnorm. Subsurf. Pressure
Baton Rouge
Louisiana
USA

Publication date- Vol. 2 , 1970

Pagination- Page 51 , 8 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Texas / Engineering geology / Geophysical surveys /
Geopressed reservoirs / Seismic surveys / Geopressure / Gulf
Coast / Prediction / United States /

72. GGIS-100240/J/ / /A/ // //

Title- An Environmental Overview of Geothermal Resources
Development

Author(s)- / Tarlock , A. Dan. / Waller , Richard L. /
Journal- Land Water Law Review

Publication date- Vol. 13 , Issue 1 , 1977

Pagination- Page 289 , 36 Pages

Auxiliary expression(s)-
Ref.

Descriptor(s)- / Air pollution / Energy source development /
Environmental effects / Exploitation / Geothermal energy
conversion / Geothermal resources / Land use / Noise pollution /
Regulations / Water pollution /

Abstract by EIC

Development of geothermal energy is not without serious environmental problems, but the impacts of exploitation appear to be less severe than those associated with other fuels. The major physical adverse environmental effects at each stage of geothermal development (exploration, test drilling, production testing, field development, and power generation) are surveyed. Land use problems, water pollution, and air and noise problems are considered. A review of regulatory strategy focusing on these impacts reveals that clarity is missing.

73. GGIS-100533/O/ / /A/ // //

Title- An Evaluation of Geopressed Brine Injectability

Author(s)- / Owen , L.B. / Blair , C.K. / Harran , J.E. / Netherton , R. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Geopressured Geothermal Bibliography

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 98 , 7 Pages

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (1) /

Table

Ref.

Descriptor(s)- / Brazoria County / Brines / Comparative evaluations /
Disposal wells / Gulf Coast / Injectability / Injection /
Injection wells / Liquid wastes / Methane recovery / Pleasant
Bayou No. 1 Well / Texas / Waste disposal / Waste injection /
Well information systems /

Abstract by GGIS

A field evaluation is reviewed of injectability characteristics of geopressured brine at the Pleasant Bayou No. 1 Well in Brazoria County, Texas. Injectability tests are performed utilizing an apparatus developed to use membrane filters as injection zone reservoir analogs. Conclusions are drawn that Brazoria brine has high injectability at various pressures.

74. GGIS-100286/J/ / /A/ / / / /

Title- An Industry View of the U.S. Natural Gas Challenge

Journal- Pipe Line Ind.

Publication date- Vol. 48 , Issue 5 , May 1978

Pagination- Page 37 , 6 Pages

Auxiliary expression(s)-

Illus. / Photo. (5) /

Descriptor(s)- / Economics / Energy demand / Energy storage /
Geopressured zones / Gulf of Mexico / Investment / Louisiana /
Methane / Natural gas deposits / Texas / Financing /

Abstract by Energyline

AGA chairman H. A. Proctor answers questions concerning the U.S. future of natural gas, how the U.S. can approach energy independence, and how natural gas will play a key role in the U.S. economy during the next 20 years. The expansion of the gas industry's supply capability through additional storage and peak shaving facilities has stemmed the recurrence of the natural gas shortages experienced in the winter of 1976-77. The future of LNG imports is discussed. Estimates of U.S. natural gas reserves are presented. The potential of methaneated geopressure zones under the Gulf of Mexico and coastal areas of Texas and Louisiana is examined. The gas supply situation next winter is expected to be better than it has been in recent years. It is estimated that, from 1978-85, the gas utility industry will invest more than \$54 billion in traditional investments areas and about \$19 billion in supplemental projects.

75. GGIS-100528/O/ / /A/ / / / /

Title- An Integrated Physicochemical Model for the Injection of Waste Geopressure d Fluids into a Saline Project

Author(s)- / Alexander , J.H. / Garg , S.K. / Pritchett , J.W. / Weare , J.H. / Kharaka , Y.K. /
Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 149 , 3 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (4) /

Ref.

Descriptor(s)- / Aquifers / Artificial recharge / Brines / Gulf Coast / Mathematical models / Salinity / Simulation / Waste injection /

Abstract by GGIS

Combined physicochemical processes necessary to the successful reinjection of geopressured fluid wastes into a saline aquifer are represented by a time-dependent model. The model, its assumptions, and the computer program used for solution are discussed. A sample calculation is provided.

76. GGIS-100240/J/ / /A/ / / / /

Title- An Overview of the California Permitting Access

Author(s)- / Trower , E. Dale /

Journal- Land Water Law Review

Publication date- Vol. 13 , Issue 1 , 1977

Pagination- Page 325 , 24 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / California / Geothermal exploration / Geothermal resources / Licensing / Regulations /

Abstract by EIC

For more than 15 years, California has been developing a sophisticated geothermal regulatory structure, which is described. The exploration permitting process is emphasized. The newly enacted Napa County Geothermal Ordinance illustrates the powers that California has delegated to local units. It is hoped that the new environmental impact review guidelines and the California Div. of Oil and Gas regulations will streamline the search and development of the geothermal resource potential.

77. GGIS-100435/R/ / /M/ / / / /

Title- An Overview of the Imperial Valley Environmental Project

Author(s)- / Anspaugh , L. R. / Phelps , P. L. /

Conference- National Geothermal Conf.

Palm Springs

CA

USA (April 19 , 1976)

Publication date- April 8 , 1976

Pagination- 14 Pages

Geopressured Geothermal Bibliography

Report/patent- UCID-17067

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Energy Research and Development Administration,
Washington, D.C. (USA)

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Livermore Lab.

Livermore , USA

Auxiliary expression(s)-

Illus. / Diagram (2) / Map (1) /

Table

Descriptor(s)- / Air monitoring / Air pollution / Air quality / Data
compilation / Ecosystems / Environment / Environmental impacts /
Ground subsidence / Imperial Valley / Research programs /
Seismicity / Socio-economic factors / Water monitoring / Water
pollution / Water quality /

Abstract by Author

The Lawrence Livermore Laboratory has been appointed by the U.S. Energy Research and Development Administration to be the "lead laboratory" for carrying out a long-term project to acquire complete understanding of the environmental quality in the Imperial Valley of California prior to any major developments. The purpose of this project is to ensure that the development of geothermal resources proceeds on an environmentally sound basis. Consequently, the Imperial Valley Environmental Project (IVP) is committed to an intensive and comprehensive study designed to establish an environmental baseline for the Imperial Valley as well as to develop an understanding of the environmental and other effects associated with development of geothermal resources. The IVP is organized into seven main study sections, which when taken together cover all the significant issues and concerns. The sections are: (1) Air Quality; (2) Water Quality; (3) Ecosystem Quality (Soil, Plants, Animals, etc.); (4) Subsidence and Induced Seismicity; (5) Health Effects; (6) Socio-economics; (7) Integrated Assessment. A strong thrust of the project is to integrate the output of the various studies into a single overall assessment. This includes not only the data obtained from the Lawrence Livermore Laboratory studies but input from all other identifiable programs as well. To this end, the Imperial Valley Environmental Project is developing a data base from information available through a number of previous and current studies relating to the long-term environmental assessment of the Imperial Valley. The Lawrence Livermore Laboratory is working closely with a number of universities and various federal, state and county agencies and other groups to obtain the needed information. These efforts are in part funded by the Imperial Valley Environmental Project. Also, a great deal of cooperation with various other public groups has also been achieved, and their programs in some cases have been reoriented to assist on problems specific to the development of geothermal resources in Imperial Valley.

78. GGIS-100128/R/ / /M/ / / / /

Title- An Overview of the Imperial Valley Environmental Project
 Author(s)- / Anspaugh, L. R. / Phelps, P. L. /
 Publication date- April 8, 1976
 Pagination- 14 Pages
 Report/patent- UCID-17067
 Note- from National Geothermal Conference Palm Springs, California,
 USA April 19-22, 1976.
 Available- NTIS
 (Paper copy)
 (Microfiche)
 Sponsor- / ERDA
 W-7405-ENG-48 /
 Corporate Author- California University, Livermore
 Lawrence Livermore Laboratories
 Livermore, California, USA
 Auxiliary expression(s)-
 Illus. / Chart (2) / Map (1) /
 Table
 Descriptor(s)- / Air quality / Ecology / Environmental effects /
 Ground subsidence / Imperial Valley / Research programs /
 Seismicity / Socio-economic factors / Water quality /
 Abstract by ERA

The Lawrence Livermore Laboratory has been appointed by the U. S. Energy Research and Development Administration to be the lead laboratory for carrying out a long-term project to acquire complete understanding of the environmental quality in the Imperial Valley of California prior to any major developments. The purpose of this project is to ensure that the development of geothermal resources proceeds on an environmentally sound basis. Consequently, the Imperial Valley Environmental Project (IVP) is committed to an intensive and comprehensive study designed to establish an environmental baseline for the Imperial Valley as well as to develop an understanding of the environmental and other effects associated with development of geothermal resources. The IVP is organized into seven main study sections, which when taken together cover all the significant issues and concerns. The sections are: air quality; water quality; ecosystem quality (soil, plants, animals, etc.); subsidence and induced seismicity; health effects; socio-economics; and an integrated assessment. (AUTH)

79. GGIS-100528/O/ / /A/ / / / /

Title- An Overview of Environmental Factors in Geopressured-Geothermal Energy Development
 Author(s)- / Groat, C.G. / Van Sickle, V.R. /
 Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)
 Publication date- 1981
 Pagination- Page 43, 2 Pages
 Local Availability- GGIS
 Local Availability- CES

Geopressured Geothermal Bibliography

Sponsor- / Department of Energy, Washington, D.C. (USA)
DE-AC08-81NV10174 /
Descriptor(s)- / Energy source development / Environment /
Environmental effects / Fault activation / Geothermal resources
/ Ground subsidence /
Abstract by GGIS

As in all energy resource development, one of the public's concerns is that of preserving the environment's natural balance. The potential impacts that geopressured geothermal resource development may have on the surrounding environment are easily identified, yet may not be easily understood. Air and water standards present no real problem as far as being able to monitor and evaluate environmental impacts, but the effects of geopressured geothermal resource development on the land, subsidence and induced faulting, are much more difficult to foresee. A general discussion of this problem is presented.

80. GGIS-100441/R/ / /M/ / / / /

Title- Analysis of a Radial Outflow Reaction Turbine Concept for
Geothermal Application

Author(s)- / House, P. A. /

Publication date- May 25, 1978

Pagination- 16 Pages

Report/patent- UCRL-52480

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
Geothermal Energy

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Livermore Lab.

Livermore, USA

Auxiliary expression(s)-

Illus. / Diagram (7) / Graph (1) /

Table

Descriptor(s)- / Expansion / Flashed steam systems / Geothermal
energy conversion / Hot water systems / Power generation / Total
flow systems / Turbines / Two phase flow /

Abstract by Author

Described herein is the radial-outflow reaction turbine, a pure-reaction turbine designed to improve the conversion efficiency of geothermal energy into electrical power. It also has potential as a total-flow turbine for low-temperature water. We can use the principle of incomplete expansion to obtain a reduction in turbine size when the turbine exhausts into a low-pressure condenser. And, by adding this turbine to single- and two-stage flashed-steam systems, we can improve the conversion efficiency of systems utilizing low- and high-energy wellhead sources, respectively. The Appendix outlines our analysis of the radial-outflow reaction turbine and leads to an expression for engine efficiency.

81. GGIS-100156/R/ / /M/ / / / /

Title- Analysis of the Binary Cycle for Geothermal Power Generation

Author(s)- / Madsen , W. W. / Ingvarsson , I. J. /

Publication date- December 1975

Report/patent- ANCR-1245

Available- NTIS

(Paper copy)

(Microfiche)

Corporate Author- Aerojet Nuclear Co.

Idaho National Engineering Lab.

Idaho Falls , Idaho , USA

Descriptor(s)- / Binary cycles / Boiling / Computer codes / Design /
Electric power generation / Geothermal energy conversion /
Geothermal power plants / Systems analysis / Thermodynamic
properties / 2-methylpropane / Power generation / Working fluids
/

Abstract by NTIS

Exchanging heat from hot geothermal fluid to a secondary working fluid which is then expanded through a turbine appears to be the best way of producing electrical power from a medium temperature geothermal resource. A study has been made to determine the conceptual design state points for a dual boiling system which utilizes isobutane as the working fluid. The results of this work and the sensitivity of plant performance to variations from nominal design points are presented. In addition, variations due to tolerances applied to thermodynamic properties and other key factors are included.

82. GGIS-100124/B/ / /M/ / / / /

Title- Analysis of the Potential Use of Geothermal Energy for Power Generation Along the Texas Gulf Coast

Author(s)- / Wilson , J. S. / Shepherd , B. P. / Kaufman , S. /

Publication date- 1974

Note- See subsequent report NSF--RA-N--74-246, Same title, authors;
GGIS TRN 77.00125

Available- Governor's Energy Advisory Council

Governor's Energy Advisory Council

P.O. Box 12428

Capitol Station

Austin, Texas 78711

Corporate Author- State of Texas

Governor's Energy Advisory Council

Austin , Texas , USA

Descriptor(s)- / Capital / Comparative evaluations / Exploration /
Geopressured systems / Geothermal energy / Geothermal
exploration / Geothermal power plants / Gulf of Mexico /
Investment / Natural gas / Offshore sites / Power generation /
Production / Sand / Texas /

83. GGIS-100125/R/ / /M/ / / / /

Title- Analysis of the Potential Use of Geothermal Energy for Power Generation Along the Texas Gulf Coast

Author(s)- / Wilson , J. S. / Shepherd , B. P. / Kaufman , S. /

Publication date- March 15 , 1975

Report/patent- NSF-RA-N--74-246

Corporate Author- Dow Chemical Co.

Freeport , Texas , USA

Descriptor(s)- / Coastal regions / Cost / Economics / Geopressured systems / Geothermal energy / Geothermal power plants / Geothermal resources / Gulf of Mexico / Natural gas / Power generation / Power potential / Recovery processes / Sand / Shale / Texas /

Abstract by ERDA/RECON

Three forms of potential geothermal energy may exist in the state of Texas: hot rocks in the Trans Pecos region, convection type geothermal water in the Rio Grande Rift Basin, and geopressured geothermal water along the Gulf Coast. Of these, only the geopressured waters have been verified. Exploration wells for oil and gas have established the presence of deep hot water deposits along the coastal area, offshore and inland for 75 miles. These exist in thick shale and sand beds in the geopressured zone. The most favorable area appears to be at depths of 12,000 to 15,000 feet where the temperatures range from 300 to 400 degrees F. Indications are that a series of relatively small, 10 to 50 megawatt, power plants could be located along the Coastal Plain of Texas. These plants could produce at least 20,000 megawatts and possibly as much as 100,000 megawatts under the most favorable conditions. Cost of the power appears to be in the range of 25 to 35 mills per kilowatt hour in 1980 providing the water is saturated with natural gas which could be sold to offset some of the cost. If the gas is present, at least 6 billion cubic feet per day of natural gas would be produced. Unit capital investment for such plants would exceed projected costs for nuclear or fossil fueled power plants. Successful development of a demonstration plant with public funds could establish the viability of geopressured waters as a source of power and natural gas and encourage private investment to exploit this energy source, should it prove competitive with other sources of electric power generation.

84. GGIS-100004/O/ / /A/ / / / /

Title- Analysis of the Potential Use of Geothermal Energy for Power Generation Along the Texas Gulf Coast

Author(s)- / Wilson , J. S. / Shepherd , B. F. / Kaufman , S. /

Conference- Development and Utilization of Geothermal Resources

Publication date- Vol. 1 , May 29 , 1975

Pagination- Page 1865 , 5 Pages

Available- Superintendent of Documents

U.S. Government Printing Office

Washington, D.C.

20402
 USA
 Local Availability- CES
 Descriptor(s)- / Texas / Louisiana / Figures / Tables / Geopressured
 systems / Forecasting / Power generation / Depths / Flow rate /
 Temperature measurement / Methane / Site selection / Design /
 Economics / Flooding / Binary cycle power generation / Fluid flow
 /

 85. GGIS-100002/0/ / 3/A/ / / / /

**Title- Analysis of Abnormally Pressured Gas Reservoirs with Partial
 Water Influx**
 Author(s)- / Bass , D. M. /
 Conference- Abnorm. Subsurf. Pressure
 Baton Rouge
 Louisiana
 USA
 Publication date- Vol. 3 , 1972
 Pagination- Page 81 , 6 Pages
 Descriptor(s)- / Engineering geology / Geopressured reservoirs /
 Overburden pressure / Pressure buildup / Geopressure / Natural
 gas / Analysis / Water influx / Partial / Pore water /

 86. GGIS-100403/R/ / /M/ / / / /

**Title- Analysis of Binary Thermodynamic Cycles for a Moderately
 Low-Temperature Geothermal Resource**
 Author(s)- / Demuth , O. Jack /
 Publication date- July 1979
 Pagination- 107 Pages
 Report/patent- TREE-1365
 Available- NTIS
 (Paper copy)
 (Microfiche)
 Local Availability- CES
 Sponsor- / Department of Energy, Idaho Falls, ID (USA). Idaho
 Operations Office
 DE-AC07-76ID01570 /
 Corporate Author- Idaho National Engineering Lab.
 Idaho Falls , USA
 Auxiliary expression(s)-
 Illus. / Diagram (7) / Graph (5) /
 Table
 Ref.
 Descriptor(s)- / Binary cycle power generation / Binary cycles /
 Boilers / Calculation methods / Comparative evaluations /
 Condensers / Cost / Data analysis / Geothermal fluids /
 Geothermal resources / Heaters / Hydrocarbons / Low temperature
 / Mathematical methods / Mixtures / Numerical analysis / Pentane
 / Thermodynamic cycles / Working fluids / 2-methylpropane /
 Abstract by Author
 Analyses of a number of geothermal binary-cycles were made
 with the objective of finding a cycle which can produce low-cost

Geopressured Geothermal Bibliography

electrical energy from a moderately low-temperature geothermal resource. Cycles were screened which included isobutane, pentane, cis-2-butene, and several mixed hydrocarbon working fluids. Dual- and triple-boiling cycles were analyzed. Both shell-and-tube and direct-contact boilers, heaters, and condensers were assessed. A geothermal fluid (geo-fluid), typical of Raft River resource conditions was assumed, which has a temperature of 290 deg F and 52 parts per million dissolved nitrogen. Special emphasis in the analyses was directed toward investigation of several methods for keeping the loss of working fluid for the cycle at an acceptable level. It was concluded that for the Raft River geo-fluid, the direct-contact cycle has a potential for net geo-fluid utilization effectiveness values, (watt-hr/lbm geo-fluid) equivalent to those of the shell-and-tube cycle. Therefore, because of the lower cost of direct-contact components, a potential exists for the direct-contact plant to produce lower cost electrical energy than a comparable shell-and-tube plant. Advance cycles were assessed which showed improvements in net geo-fluid utilization effectiveness, relative to the first Raft River 5-MW Pilot Plant (dual-boiling, shell-and-tube isobutane cycle), of up to 19%.

87. GGIS-100591/R/ / /M/ / / / /

Title- Analysis of Cameron Parish Geopressured Aquifer

Publication date- 1978

Pagination- 18 Pages

Report/patent- NVO-1561-1

Note- Isothermal map included

Available- NTIS

Corporate Author- Magma Gulf Co.

Baton Rouge , LA , USA

Descriptor(s)- / Analysis / Aquifers / Cameron Parish / Geopressured
reservoirs / Isothermal maps /

88. GGIS-100398/R/ / /M/ / / / /

Title- Analysis of Cameron Parish Geopressured Aquifer

Subtitle- Final Report

Author(s)- / Durham , C.O. /

Publication date- September 1978

Pagination- 38 Pages

Report/patent- NVO-1561-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
Geothermal Energy

ET-78-C-08-1561 /

Corporate Author- Magma Gulf Co.

Baton Rouge , LA , USA

Auxiliary expression(s)-

Illus. / Graph (11) / Map (3) / Figure (8) /

Table

Descriptor(s)- / Analysis / Aquifers / Cameron Parish / Geological setting / Geophysical exploration / Geopressed reservoirs / Geosynclines / Geothermal gradients / Louisiana / Net sand maps / Reservoir description / Sand / Seismic surveys / Site selection / Sweet Lake Prospect / Uplifts / Well data / Well logging /

Abstract by (Unknown)

The Sweet Lake geopressed-geothermal prospect is located in northern Cameron Parish, Louisiana in T. 12 S., R. 7 W. and T. 12 S., R. 8 W. approximately 10-15 miles south of Lake Charles. The region is characterized by Cenozoic sand and clay deposits of geosynclinal thickness and differentially uplifted salt structures. The primary geopressed-geothermal aquifer is the "Miogyp" sand of the Camerina zone (Upper Frio formation of Oligocene-Miocene age). The main prospect is located in a basin on the north flank of the Hackberry-Big Lake-Sweet Lake salt ridge. Interpretation of 27 miles of seismic lines and 17 deep well logs localizes the prospect in a basin with northwesterly dip in a graben between east-west faults converging eastward. Aquifer depth ranges from 14,000 to 18,000 feet. Net sand thickness exceeds 400 feet with 22% porosity. Temperatures range from 280 deg F (corrected) at 14,000 feet to 350 deg F at 18,000 feet. Geopressures occur below 9,000 feet with mud weight equivalents in the sand from 12 to 13 pounds per gallon. Net sand volume of one cubic mile is estimated in the area mapped.

89. GGIS-100393/0/ / /A/ / / / /

Title- Analysis of Cameron Parish Geopressed-Geothermal Aquifer, Sweet Lake Prospect

Author(s)- / Durham, Clay O., Jr. / Parsons, Brian E. / Rodgers, Robert W. /

Publisher- 4th Geopressed Geothermal Energy Conference

Publication date- Vol. 3, June 1980

Pagination- Page 1439, 29 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA) /

Auxiliary expression(s)-

Illus. / Graph (6) / Map (4) / Figure (2) /

Table

Descriptor(s)- / Aquifer tests / Areal geology / Cameron Parish / Geological setting / Geopressed reservoirs / Louisiana / Reservoir pressure / Reservoir temperature / Sand / Seismic survey / Site selection / Well testing /

Abstract by Author

The Sweet Lake geopressed-geothermal prospect is located in northern Cameron Parish, Louisiana, in T.12S., R.7W and T.12S., R.8W. approximately 10-15 miles south of Lake Charles. The region is characterized by Cenozoic sand and clay deposits of

geosynclinal thickness and differentially uplifted salt structures. The primary geopressured-geothermal aquifer is the "Miogyp" sand of the Camerina zone (Upper Frio formation of Oligocene-Miocene age). The main prospect is located in a basin on the north flank of the Hackberry-Big Lake-Sweet Lake salt ridge. Interpretation of 27 miles of seismic lines and 17 deep well logs localizes the prospect in a basin with northwesterly dip in a graben between east-west faults converging eastward. Aquifer depth ranges from 14,000 to 18,000 feet. Net sand thickness exceeds 400 feet with 22% porosity. Temperatures range from 280 DEG F (corrected) at 14,000 feet to 350 DEG F at 18,000 feet. Geopressures occur below 9,000 feet with mud weight equivalents in the sand from 12 to 13 pounds per gallon. Net sand volume of one cubic mile is estimated in the area mapped. Magma Gulf Company identified and leased the Sweet Lake prospect in 1975, submitted it as a proposed drilling and test site, and submitted it to ERDA under a Request for Proposals in 1976. It was selected over competition in 1977, and Magma Gulf performed additional seismic evaluation under DOE sponsorship in 1978. A detailed plan for a 24-month drilling and testing program has been approved by DOE. Techadril, Inc., an affiliate of Goldrus Drilling Company, has joined Magma Gulf as a joint venture partner for the project. The drillsite is located on a lease acquired in 1979 from the Amoco Production Company.

90. GGIS-100592/R/ / /M/ / / / /

Title- Analysis of Ecological Effects of Geopressured-Geothermal Resource Development

(Geopressured - Geothermal Technical Paper No. 4)

Publication date- June 1979

Pagination- 137 Pages

Available- NTIS

Sponsor- / ET-78-G-05-5958 /

Descriptor(s)- / Air pollution / Analysis / Ecosystems / Environmental effects / Geopressure resources / Ground subsidence / Land pollution / Noise pollution / Resource development / Well drilling /

Abstract by NTIS

The activities involved in geopressured geothermal resource production are identified and their ecological impacts are discussed. The analysis separates those activities that are unique to geopressured geothermal development from those that also occur in oil and gas and other resource developments. Of the unique activities, those with the greatest potential for serious ecological effect are: (1) accidental brine discharge as a result of a blowout during well drilling; (2) subsidence; (3) fault activation and enhanced seismicity; and (4) subsurface contamination of water, hydrocarbon, and mineral reservoirs. Available methods to predict and control these effects are discussed.

91. GGIS-100264/R/ / /M/ / / / /

**Title- Analysis of Electricity Production Costs from the Geopressed
Geothermal Resource**

Author(s)- / Bloomster , C.H. / Knutson , C.A. /

Publication date- February 1977

Pagination- 75 Pages

Report/patent- BNWL-2192

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U.S. Energy Research and Development Administration

EY-76-C-06-1830 /

Corporate Author- Battelle Pacific Northwest Labs.

Richland , Washington , USA

Descriptor(s)- / By-products / Cost / Economics / Electric power / G
codes / Geopressed systems / Geothermal energy conversion /
Geothermal power plants / Gulf of Mexico / Methane / Optimization
/ Power generation / Power potential / Power range 1-10 mw /
Power range 10-100 mw / Recovery processes /

Abstract by TIC

The economics of the geopressed geothermal resource along the northern coast of the Gulf of Mexico is assessed. Geopressed waters are nearly under twice the normal hydrostatic pressure and believed to be saturated with methane. The costs of generating electricity from this resource are estimated based on the description and conceptual development plans provided by the United States Geological Survey (USGS). Methane content and selling prices are the most important factors affecting the commercial potential of geopressed resources--so it is important that electrical generation be viewed as a by-product of methane production. On the same incremental cost basis, the cost of electricity generated from the geohydraulic energy is potentially competitive with conventional energy sources. This would require development of a small commercial high pressure, hydraulic turbine to extract geohydraulic energy at the wellhead in plants of about 3 MW capacity. Price/quantity relationships are developed for electricity generation from geopressed resources for each of three development plans proposed by USGS. Studies, based on field constructed plants, indicated an optimum power plant size in the range of 20 to 60 MWe, depending on water temperature. However, if standardized thermal conversion power plants could be factory produced in the 6 MWe range competitively with larger field constructed plants, then the optimum plant size might be reduced to single wellhead units. Wellhead units would completely eliminate fluid transmission costs, but would probably incur higher costs for heat rejection, power plant operation, and electrical transmission. The upper cost target for competitive wellhead plants would be on the order of \$800/kW in 1975 dollars.

92. GGIS-100567/R/ / /M/ // //

Title- Analysis of Geopressed Aquifers

(Annual Report, Jan. - Dec. 1980)

Author(s)- / Doherty , Mark G. /

Publication date- August 1981

Pagination- 155 Pages

Geopressured Geothermal Bibliography

Report/patent- PB82-110297

Available- NTIS

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRI-5011-310-0109 /

Corporate Author- Institute of Gas Technology

Houston, TX, USA

Descriptor(s)- / Aquifers / Economic analysis / Geopressure resources
/ Recovery processes / Reservoir properties / Simulation /
Technology assessment /

Abstract by NTIS

The Institute of Gas Technology undertook technical and economic analyses of the coproduction of water and gas from watered-out geopressured gas caps, hydropressured aquifers, and low-permeability geopressured aquifers for the Gas Research Institute. Out of over 100,000 wells screened in Louisiana and Texas, 489 were identified as having watered out under a strong water drive, making them possible candidates for watered-out geopressured gas cap wells. Based on their cumulative production, the amount of gas potentially recoverable from these wells by enhanced recovery technology was estimated to be 0.4 to 0.8 Tcf. Analyses of hydropressured aquifers by numerous computer reservoir simulations and economic analyses have determined that gas in excess of solution gas and/or exploration and cost-reducing strategies are necessary to produce the hydropressured aquifer resource at wellhead prices that are competitive in today's market. Hydraulic fracturing of low-permeability geopressured aquifers is a technically feasible and economically attractive way to increase production, but the overriding economic issue still remains the gas-water ratio of the fluids produced.

93. GGIS-100464/R/ / /M/ / / / /

Title- Analysis of Geopressured Aquifers

Original Subtitle- Annual Report for 1979

Author(s)- / Doherty, Mark G. /

Publication date- June 1980

Pagination- 64 Pages

Report/patent- PB81-123416

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRI-5011-310-0109 /

Corporate Author- Institute of Gas Technology

Chicago, IL, USA

Descriptor(s)- / Aquifers / Cost benefit analysis / Feasibility
studies / Gas caps / Gas production / Geopressured reservoirs /
Geopressured wells / Hydraulic fracturing / Hydropressure /
Natural gas deposits / Permeability / Reservoir engineering /
Resource assessment / Technology assessment / Well stimulation /

Abstract by ERA

The purpose of this project is to assemble data to analyze the possibility of natural gas production from watered-out geopressured gas cap wells and hydropressured aquifers, and to assess the technical and economic feasibility of hydraulically

fracturing a tight geopressured aquifer to increase reservoir permeability as well as gas production.

94. GGIS-100114/ / / /M/ / / / /

Title- Analysis of Geopressured Natural Gas Reservoirs

(Research Initiation, 4/74 to 9/75)

Author(s)- / Smith , J. T. /

Publication date- 1974

Note- Energyline: FU-\$13,600

Available- Mississippi State University, School of Engineering

Mississippi State Univ.

School of Engineering, Petroleum Engineering

Suite 101, Engineering Bldg.

State College, Mississippi 39762

Corporate Author- U.S. National Science Foundation

Div. of Engineering

Abstract by (Unknown)

The primary objective of this research is to collect compressibility data on geopressured sands and water influx data on geopressured shales. It will first involve both laboratory in situ determinations of compressibility as a function of geopressure and other important properties of the reservoir. Data on water influx from compacting shales will then be obtained with core samples of undercompacted shales extracted from geopressured strata. Internal fluid and external confining pressures will be separately controlled in the high-pressure tests of these cores so as to allow the flow rate of water from the shale to be measured as controlled compaction takes place. Flow potential of the shale at progressive stages of compaction will be calculated from Darcy's Law. A relationship between reservoir pressure and permeability will be developed. Production data from geopressured wells, core samples and testing apparatus will be made available by the industrial participant (AMOCO).

95. GGIS-100115/ / / /M/ / / / /

Title- Analysis of Geopressured Natural Gas Reservoirs

(Research Initiation; 7/74 to 9/75)

Author(s)- / Smith , J. T. /

Note- Fiscal Year 1975 Estimated Calendar Year Funding Reported as 1975 \$13,000

Available- Mississippi State University, School of Engineering

Mississippi State University

School of Engineering

Suite 101, Engineering Bldg.

Mississippi State, Mississippi 39762

Corporate Author- U.S. National Science Foundation

Div. of Engineering

Abstract by Energyline

The primary objective of this research is to collect compressibility data on geopressured sands and water influx data on geopressured shales. It will first involve both

Geopressured Geothermal Bibliography

laboratory in-situ determinations of compressibility as a function of pressure and other important properties of the reservoir. Data on water influx from compacting shales will then be obtained with core samples of undercompacted shales extracted from geopressured strata. Internal fluid and external confining pressures will be separately controlled in the high-pressure tests of these cores so as to allow the flowrate of water from the shale to be measured as controlled compaction takes place. Flow potential of the shale will be calculated from Darcy's Law. A relationship between reservoir pressure and permeability will be developed. Production data from geopressured wells, core samples and testing apparatus will be made available by the industrial participant. (AMOCO)

96. GGIS-100393/O/ / /A/ / / / /

Title- Analysis of Government Incentives and Resource Utilization Profiles

Subtitle- B. Six Profiles for Utilization of the Geopressured-Geothermal Resource in the Mid-Term

Author(s)- / Frederick, David O. / Prestwood, Donna C. L. / Roberts, Kenneth D. / Vanston, John H., Jr. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3, June 1980

Pagination- Page 1620, 22 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

ET-78-G-05-5959 /

Corporate Author- Texas Univ.

Center for Energy Studies

Austin, USA

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Exploitation / Financial incentives / Forecasting / Geopressure resources / Institutional aspects / Legal aspects / Natural gas industry / Petroleum industry / Power plants / Public utilities / Resource development / Uses /

Abstract by Author

The institutional structure through which the geopressured-geothermal resource is utilized in the mid-term is not expected to be homogenous over all reservoirs. This presentation details and rationalizes the four utilization profiles our research suggests are most likely to constitute, in some mix, the overall structure, given perpetuation of the current pattern of government initiatives. The profiles are: (1) development by a petrochemical firm through its production subsidiary of reservoirs for their methane content alone; this methane would be used as feedstock and as boiler fuel; (2)

development by a gas transmission company, through its production subsidiary, of reservoirs for their methane content along; this high-cost, incrementally priced methane would be sold to an industrial boiler fuel market; (3) development by an integrated energy company of reservoirs for their methane content alone; though the company might use the methane in refinery processes, most would be sold to transmission companies; and (4) development by an electric utility, through its production subsidiary, of reservoir for their methane content along; this methane would be used as fuel for (largely) existing gas-fired boilers. The presentation also details and rationalizes two electricity generation profiles which appear less unlikely than others: (5) development by a project company of contiguous reservoirs for both their methane content and heat content; these components would be sold to an electric utility for use in a hybrid methane-heat fueled power plant owned by the project company, and (6) development by an electric utility, through its production subsidiary, of contiguous reservoirs for their methane and heat content; these components would be used in a hybrid methane-heat fueled powerplant owned by the utility.

97. GGIS-100393/0/ / /A/ // //

Title- Analysis of Government Incentives and Resource Utilization Profiles

Subtitle- A. Current Government Incentives Bearing On Geopressured-Geothermal Development

Author(s)- / Frederick , David O. / Prestwood , Donna C.L. / Roberts , Kenneth D. / Vanston , John H., Jr. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1602 , 18 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

ET-78-G-05-5939 /

Corporate Author- Texas Univ.

Center for Energy Studies

Austin , USA

Descriptor(s)- / Charges / Economic policy / Energy policy / Financial incentives / Gas production / Geopressure resources / Legal aspects / Methane / Regulations / Resource development / Taxes / US DOE / Uses /

Abstract by Author

Numerous government initiatives have been undertaken in recent years which have impacts on geopressured-geothermal development. "Geothermal" initiatives in some cases are not clearly applicable to the geothermal component of geopressured resources because of the presence of the methane component. Various natural gas production incentives have a direct impact on

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geopressured methane development and, hence, make production of the geothermal component more likely also. This presentation (1) examines the applicability of the Geothermal Loan Guaranty Program to geopressured development, (2) explains DOE-DGE well drilling plans (as budgeted), (3) examines federal tax incentives to geopressured development, (4) discusses geopressured methane price incentives and disincentives, (5) explains the Economic Regulatory Administration's ruling allowing geopressured methane boiler fuel, and (6) analyzes the legal problems confronting a developer who would transport either electricity or methane from the resource site for use elsewhere.

98. GGIS-100553/R/ / /M/ / / / /

Title- Analysis of Initial Flow Data from MG-T/DOE Amoco Fee No.1 Well

Author(s)- / Garg , S.K. /

Publication date- August 1981

Pagination- 29 Pages

Report/patent- DOE/NV/10150-2

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80NV10150 /

Corporate Author- Systems, Science and Software

La Jolla , CA , USA

Descriptor(s)- / Analysis / Data analysis / Flow rate / MG-T/DOE Amoco Fee No.1 Well / Performance testing / Permeability / Pressure buildup / Testing /

Abstract by NTIS

Analysis of buildup data from the Initial Flow Test indicates that the MG-T/DOE Amoco Fee No. 1 Well penetrates a zone of relatively high permeability (approx. 150 md); this high permeability zone, however, extends to a radius of only about 200 ft from the wellbore. The far field permeability (i.e., for r greater than 200 ft) appears to be rather low (approx. 11 md). No reservoir boundaries can be identified from the Initial Flow Test. The reservoir simulator MUSHRM together with the formation parameters inferred from the buildup data were employed to history match the observed drawdown/buildup pressures and flow data. The calculated buildup pressures closely agree with the measured values; the rather poor agreement between the measured and calculated drawdown pressures is ascribed to the uncertainties in the flow rate data.

99. GGIS-100407/O/ / /A/ / / / /

Title- Analysis of Injection Testing of Geothermal Reservoirs

Author(s)- / O'Sullivan , Michael / Pruess , Karsten /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 401 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vase! W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Graph (2) /

Ref.

Descriptor(s)- / Aquifers / Comparative evaluations / Computer codes
/ Computerized simulation / Equations / Flow rate / Geothermal
reservoirs / Hot water / Injection / Mathematical models /
Numerical analysis / Numerical solution / Pressure buildup /
Testing /

Abstract by GGIS

Two methods for analyzing pressure buildup produced by water injection into a geothermal reservoir are compared in this report. The physical properities of the hot or boiling reservoir fluid are significantly different from those of the cold, injected fluid; this work furthers understanding of reservoir behavior by introducing methods for numerical simulation. The two methods are: the integrated finite difference method as implemented in the SHAFT79 program, and a quasi-analytical method that uses a similarity variable to allow calculation of flow induced by injection of water into the reservoir. Preliminary results show the SHAFT79 program to be useful, and to be more flexible than the similarity method in terms of the types of tests to which it can be applied.

100. GGIS-100528/0/ / /A/ / / / /

Title- Analysis of Phase I Flow Data From Pleasant Bayou No. 2
Geopressured Well

Author(s)- / Garg , S.K. / Riney , T.D. / Fwu , J.M. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 97 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-NV10150 /

Auxiliary expression(s)-

Illus. / Graph (5) / Map (1) /

Ref.

Descriptor(s)- / Analysis / Brazoria County / Computerized simulation
/ Data / Flow rate / Fluid flow / Gulf Coast / Pleasant Bayou No.
2 Well / Reservoir pressure / Texas /

Abstract by Author

Geopressured Geothermal Bibliography

Analysis of pressure drawdown/buildup data from the Phase I 45-day production/45-day shutin test indicates (1) the presence of a linear barrier at approximately 3,000 ft and (2) that the skin factor varies widely during the test. The linear barrier appears to correspond to a mapped growth fault. At present, we are unable to identify the physical mechanism responsible for the apparent variation of skin factor. The formation parameters derived from the buildup data have been employed in the MUSHRM simulator to successfully history-match the Phase I pressure and flow data.

101. GGIS-100533/O/ / /A/ / / / /

Title- Analysis of Preliminary Flow Data from Pleasant Bayou No. 2 Geopressured Well

Author(s)- / Garg , S.K. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 76 , 8 Pages

Local Availability- GGIS

Corporate Author- Systems, Science and Software
La Jolla , CA , USA

Auxiliary expression(s)-

Illus. / Graph (6) /

Ref.

Descriptor(s)- / Analysis / Bottom hole pressure / Brazoria County /
Equations / Flow rates / Flowmeters / Fluid flow / Fluid pressure
/ Geopressured wells / Gulf Coast / Pleasant Bayou No. 2 Well /
Pressure build-up / Pressure decline / Pressure measurement /
Salinity / Simulation /

Abstract by GGIS

Preliminary short term production and buildup tests of the Pleasant Bayou No. 2 Geopressured Well are analyzed and the formation parameters evaluated. Conclusions drawn indicate a mobility change at approximately 3,500 ft., and possibly a mobility barrier at 17,000 ft.

102. GGIS-100999/O/ / /A/ / / / /

Title- Analysis of Raft River Heat Exchanger Fouling Data Using a Multivariate Regression Technique

Author(s)- / Mines , G.L. / Neill , D.T. /

Conference- 13th Intersociety Energy Conversion Engineering
Conference

Pagination- Page 1135 , 6 Pages

Report/patent- SAE--789317

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (5) /

Table

Ref.

Descriptor(s)- / Binary cycle power generation / Fluidized bed heat exchangers / Fouling / Geothermal brines / Materials testing / Performance testing / Transfer pipes /

Abstract by Author

Heat exchanger fouling is an important parameter in the design of all heat exchangers, particularly those to be employed in low to medium temperature geothermal resource applications where required heat exchange areas are large. Heat exchange fouling tests have been underway at Raft River for the past year with admiralty brass tubes, the material selected for the 5 MW(e) Raft River test facility. Initial data reduction efforts revealed that conventional methods of calculating the fouling resistance as the change in the overall thermal resistance with time would not work. By using a multivariate regression analysis, the seasonal and daily ambient air temperature changes could be incorporated into the data reduction procedure. With this technique it was possible to measure an annual fouling resistance considerably lower than specified when ordering heat exchangers for the large test facility.

103. GGIS-100393/0/ / /A/ / / / /

Title- Analysis of Texas Gulf Coast Tertiary Sandstones to Delineate Areas of High-Quality Geopressured Geothermal Reservoirs

Author(s)- / Loucks , Robert G. / Dodge , Marianne M. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 1 , June 1980

Pagination- Page 373 , 41 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

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78712

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA) Div. of Geothermal Energy /

Corporate Author- Texas Univ., Austin

Bureau of Economic Geology

Austin , TX , USA

Auxiliary expression(s)-

Illus. / Graph (14) / Map (4) / Figure (6) / Table

Ref.

Descriptor(s)- / Diagenesis / Drill cores / Geopressure exploration / Geopressured reservoirs / Mineralogy / Permeability / Porosity / Resource assessment / Sandstone / Texas /

Abstract by Author

Analysis of reservoir quality of lower Tertiary sandstones along the Texas Gulf Coast delineates areas most favorable for geopressured geothermal exploration. Reservoir quality is determined by whole core and petrographic analyses. Wilcox sandstones exhibit no regional reservoir quality trends. In Lower and in parts of Middle and Upper Texas Gulf Coast the sandstones are relatively well consolidated, but in other parts

Geopressed Geothermal Bibliography

of Middle and Upper Texas Gulf Coast they show a reversal toward increased porosity at depth. The Wilcox Group has good reservoir potential for geopressed geothermal energy in the Middle Texas Gulf Coast and possibly in adjacent areas, but other Wilcox areas are marginal. Vicksburg sandstones have the poorest reservoir quality of sandstones of any formation and are not prospective for geothermal energy. Reservoir quality in the Frio Formation increases from very poor in lowermost Texas, to marginal into the Middle Texas Gulf Coast and to good through the Upper Texas Gulf Coast. This increase in reservoir quality correlates to changes in rock composition and cementation. The Frio Formation in the Upper Texas Gulf Coast has the best deep-reservoir quality of any unit along the Texas Gulf Coast.

104. GGIS-100401/R/ / /M/ / / / /

Title- Annotated Research Bibliography for Geothermal Reservoir Engineering

Author(s)- / Sudol , G.A. / Harrison , R.F. / Ramey , H.J. /

Publication date- August 1979

Pagination- 153 Pages

Report/patent- LBL-8664

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Berkeley Lab.

Berkeley , USA

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Bibliographies / Exploitation / Formation testing /
Geothermal reservoirs / Management / Models / Production /
Reservoir engineering /

Abstract by GGIS

An annotated bibliography of research in geothermal reservoir engineering is presented. Included are articles in English, Italian, Russian, and Japanese. The materials were collected under four categories: (1) formation evaluation -- formation parameters such as porosity, permeability, thermal conductivity, etc; (2) reservoir modeling -- analytical, numerical, and physical (scale) models; (3) exploitation strategies -- reservoir management and production enhancement; (4) interpretation of production trends. The historical development of geothermal reservoir engineering is briefly sketched.

105. GGIS-100312/R/ / /M/ / / / /

Title- Annual Report on the Project to Design and Experimentally Test an Improved Geothermal Drill Bit

Author(s)- / Barker , L.M. / Green , S.J. / Maurer , W.C. / DeVries , L.K. /

Publication date- June 1976

Pagination- 40 Pages

Report/patent- TID--28684

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U.S. Energy Research and Development Administration

E(10-1)1546 /

Corporate Author- Terra Tek, Inc.

Salt Lake City , Utah , USA

Auxiliary expression(s)-

Illus. / Diagram (5) / Diagram (5) / Photo. (3) /

Table

Ref.

Descriptor(s)- / Design / Drill bits / Elastomers / Geothermal drilling / High temperature / Laboratory testing / Lubricants / Research programs / Seals / Steels /

Abstract by Author (rev.)

The problem of short drill bit life in the drilling of geothermal wells has been reasonably well defined. Bit failure modes are both bearing wear and gage wear. The high bearing wear rates are attributable to the softening of the steel bearings and bearing races as a result of exceeding the design operating temperature of the drill bits. The high bit temperature is attributable to both the high formation temperature and to the friction heat generated in the drill bit. The friction heating is high because the bits have no lubricant sealed in the bearings; and no lubricant is sealed in the bearings because even a lubricated bit runs hotter than the temperature limits of currently used seals and lubricants. Thus, it appears that a significant gain in drill-bit life can be attained by the use of higher-temperature steels which retain more hardness at temperatures above 260 DEG C (500 DEG F). Two research bits of high-temperature steels have been made and will shortly be tested in a laboratory-simulated full-scale geothermal drilling environment. Two control bits of the same design, but made with conventional drill-bit steels, have also been obtained for identical laboratory test runs. Base-line properties of the steels, such as hardness and fracture toughness as functions of temperature, are being measured. A geothermal test vessel has been designed and fabricated which is capable of temperatures to 427 DEG C (800 DEG F) and pressures to 35 Mpa (5,000 psi). In the vessel, the test bit will be subjected to the same loads and RPM as are expected in field service. However, the largest gain in drill bit life may well be attained through high-temperature seal and lubrication techniques to allow the construction of bits with sealed, lubricated bearings. Some candidate seals and lubricants have been obtained for testing, and others are being procured. In addition, a seal test vessel has been designed and will soon be completed which can simulate the geothermal drilling environment in full-scale testing of seal and lubricant designs and materials. The vessel will not only simulate pressure and temperature conditions, but also axial and radial motions of the shaft, and pressure fluctuations across the seal.

106. GGIS-100231/R/ / /M/ / / / /

Title- Annual Report. Bureau of Economic Geology, University of Texas at Austin, 1975

Publication date- 1976

Available- Bureau of Economic Geology

University Station

Box X

Austin

Texas

78712)

Corporate Author- Texas University, Austin

Bureau of Economic Geology

Austin , Texas , USA

107. GGIS-100276/R/ / /M/ / / / /

Title- Apparatus and Techniques for the Study of Precipitation of Solids and Silica from Hypersaline Geothermal Brine

Author(s)- / Hill , J.H. / Harrar , J.E. / Ottol , C.H., Jr. / Deutscher , S.B. / Crampton , H.E. / Grogan , R.G. / Hendricks , V.H. /

Publication date- July 5 , 1979

Pagination- 12 Pages

Report/patent- VCRL-52799

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Livermore Lab.

Livermore , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (3) / Graph (2) /

Table

Ref.

Descriptor(s)- / Absorption spectroscopy / Dissolved solids / Geothermal brine / Gravimetry / Laboratory equipment / Laboratory testing / Measuring instruments / Measuring methods / Precipitation / Salinity / Salton Sea / Silica minerals / Supersaturation /

Abstract by Author

The kinetics of precipitation reactions in geothermal brines can be studied accurately only if the brine samples are collected and examined under anaerobic condition and with minimum cooling. Apparatus and techniques were developed that achieve this for brine temperatures below 100 DEG C. The concentration of suspended solids is measured gravimetrically after filtration, and the concentration of dissolved silica is measured by atomic absorption spectrophotometry. Data from Woolsey No. 1 well of the Salton Sea Geothermal Field illustrate typical results of the procedures.

 108. GGIS-100995/ / / /A/ / / / /

Title- Apparatus for the Field Evaluation of Geothermal Effluent Injection

Author(s)- / Netherton , Raymon / Owen , Lawrence B. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 487 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- California Univ., Livermore

Lawrence Livermore Lab.

Livermore , California , USA

Auxiliary expression(s)-

Illus. / Diagram (4) / Graph (1) /

Ref.

Descriptor(s)- / Filtration / Geothermal reservoirs / Mineral wastes / Solid wastes / Underground disposal / Waste disposal /

Abstract by Author

Methods of evaluating subsurface disposal systems, based on data derived from membrane filtration tests and core flooding experiments, have been described in the literature. Utilizing these techniques, the authors have developed and successfully tested equipment for evaluation of injectability of any geothermal effluent including hypersaline brine from the Salton Sea Geothermal Field.

 109. GGIS-100104/P/ / /M/ / / / /

Title- Apparatus for Using a Source of Energy from an Overpressured Formation

Author(s)- / Hottman , C. E. /

Publication date- July 1967

Report/patent- 3,330,356 (US Patent

Descriptor(s)- / Distribution / Energy sources / Equipment / Geopressured systems / Geothermal energy / Geothermal resources / Gulf of Mexico / Patents / Planning / Shale / Temperature measurement / Texas / Well logging /

 110. GGIS-100123/ / / 8/A/ / / / /

Title- Appendix

(From Chapter 6 in Assessment of Geothermal Resources of the United States, 1975)

Subtitle- Discussion of Data used in Assessment of Onshore Geopressured-Geothermal Resources in the Northern Gulf of Mexico

Publication date- 1975

Pagination- Page 141 , 6 Pages

Geopressured Geothermal Bibliography

Descriptor(s)- / Geothermal resources / Geothermal energy / Geo brine
/ United States South /

Abstract by Energyline

The basis on which data presented in the various tables of ERDA/USGS report 726 were determined, calculated, or assumed is discussed, and other untabulated data and equations used in the assessments presented are examined. Using the data for evaluating energy recovery plans other than those presented in the main text of the report is illustrated. Data on average conditions in subareas, such as depth to top of geopressure, pressures, temperatures, and salinity, are analyzed. Data on properties of a conceptual reservoir include: thickness, porosity, and permeability of hydraulic conductivity; and transmissivity and storage coefficients. Density, methane content, kinematic viscosity, and specific heat of water are considered, and pipe friction and well-flow equations are detailed.

111. GGIS-100407/0/ / /A/ / / / /

Title- Application of Computer Simulation to Geothermal Heating Systems

Author(s)- / Simmons, George M. / Batdorf, James A. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 613 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (1) /

Table

Ref.

Descriptor(s)- / Computer codes / Computerized simulation / Design / Economics / Efficiency / Energy demand / Geothermal fluids / Geothermal resources / Geothermal space heating / Performance / Recommendations / Simulation / Space heating / Thermal waters /

Abstract by (Unknown) One of the goals when designing a geothermal heating system is to achieve efficient operation with a minimum flow of geothermal water. Improving system design and control provides opportunity for increasing the efficiency of the system; as a means for simplifying the design process, a model was developed to assist the designer in selecting the optimum design. The model development and the method for reducing the design to computer simulation are discussed in this report.

112. GGIS-100184/R/ / /M/ / / / /

Title- Application of Conventional Superheaters in Geothermal Power Plants

Author(s)- / Khalifa , H. E. /

Publication date- 1976

Report/patent- COO--4051-8 (APP. C)

Corporate Author- Brown University
Providence , Rhode Island , USA

Descriptor(s)- / Feasibility studies / Flashed steam systems / Fossil-fuel power plants / Geopressured systems / Geothermal fluids / Geothermal power plants / Methane / Superheating / Vapor dominated systems /

Abstract by DOE/RECON

It was shown previously that the application of geothermal feedwater heating in an otherwise conventional steam power cycle greatly improves the utilization of the geothermal resource. Here, a study of the benefits of applying fossil-fuel superheating in the case of flash or vapor-dominated systems is presented. It is suggested that the combination of a flash system and a conventional superheater may prove to be attractive in the case of geopressured reservoirs producing some methane.

113. GGIS-100468/R/ / /M/ / / / /

Title- Application of Direct Contact Heat Exchangers to Geothermal Power Production Cycles

Subtitle- Project Review, December 1, 1974 - May 31, 1977

Author(s)- / Jacobs , H.R. / Boehm , R.F. / Hansen , A.C. /

Publication date- May 31 , 1977

Pagination- 173 Pages

Report/patent- IDO/1549-8

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Energy Research and Development Administration,
Washington, D.C. (USA). Div. of Geothermal Energy
EY-76-S-07-1553 /

Corporate Author- Utah Univ.

Dept. of Mechanical Engineering

Salt Lake City , USA

Auxiliary expression(s)-

Illus. / Diagram (31) / Graph (44) / Photo (1) /

Table

Ref.

Descriptor(s)- / Boilers / Condensers / Costs / Design / Economics / Equilibrium / Evaluation / Geothermal brines / Heat exchangers / Heat transfer / Liquid flow / Performance testing / Power plants / Technology assessment / Thermodynamic cycles / Thermodynamic properties / Turbines / Vapors /

Abstract by Author

Work performed at the University on the development of direct contact heat exchanger power cycles for geothermal

Geopressured Geothermal Bibliography

applications is reviewed. The period covered in the report is from the inception of the project in 1974 through May 31, 1977. Results from a large experimental program on heat exchanger development as well as from many analyses of components and cycle performance and economics are given. A number of working fluids and operating conditions have been considered, and no major obstacles for the implementation of the concept have been discovered.

114. GGIS-100995/ / / /A/ / / / /

Title- Application of Type Curve Procedures for the Analysis of
Production Data from Geothermal Wells

Author(s)- / Rivera-R , Jesus /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 575 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (5) /

Ref.

Descriptor(s)- / Cerro Prieto geothermal field / Data analysis /
Geothermal wells / Graphs / Production / Production decline
curve /

Abstract by Author (rev.)

Past research has shown that the decline-curve analysis approach can be successfully applied to geothermal wells. By plotting monthly production vs. time on either semilog or log-log paper together with rate decline models, it was possible to predict the future production of wells of the Cerro Prieto Geothermal Field. This paper shows that production forecasting can also be performed is based on entirely graphical procedure. The procedure is based on the use of a basic dimensionless graph, on which rate decline models can be placed on a single log-log type curve. The aim of this paper is to show how this graph was used to handle production data from some wells of the Cerro Prieto Geothermal Field. The results show that the method deserves more serious consideration for application to other geothermal fields around the world.

115. GGIS-100047/J/ / 2609/A/ / / / /

Title- Application of Well-Logging to Geopressure Problems in the
Search, Drilling, and Production of Hydrocarbons
(Correlation between Geopressure and Shale-Sand Ratio,
Efficient Drilling, Rock Parameters)

Original Title- Utilisation des Diagraphies en Recherche, Forage,
et Production D'Hydrocarbure Pour L'Etude des Problemes de
Pressions Geostatiques

Author(s)- / Fertl , W. H. / Timko , D. J. /

Publisher- Inst. Fr. Petr.
 Journal- Rev. Inst. Fr. Pet.
 Publication date- Vol. 26 , Issue 9 , 1971
 Pagination- Page 687 , 28 Pages
 Language- French
 Auxiliary expression(s)-
 Sum.
 Illus. / Sketch map (1) /
 Descriptor(s)- / Well logging / Natural gas / Petroleum / Engineering
 geology / Exploration / Rock mechanics / Uses / Geopressure /
 Pore pressure /

 116. GGIS-100471/R/ / /M/ / / / /

Title- Applications of Geothermal Resources in the Evaporation and
 Crystallization Industry
 (September 1976 - October 1977)

Subtitle- Final Report

Author(s)- / May , S.C. / Basuino , D.J. / Doyle , P.T. / Rogers ,
 A.N. /

Publication date- November 1977

Pagination- 157 Pages

Report/patent- SAN/1328-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Energy Research and Development Administration,
 Washington, D.C. (USA). Div. of Geothermal Energy
 EY-76-C-03-1328 /

Corporate Author- Bechtel Corp.

San Francisco , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (15) / Graph (9) / Map (13) /

Table

Ref.

Descriptor(s)- / Brines / Crystallization / Economic analysis /
 Environmental impacts / Evaluation / Evaporation / Geothermal
 resources / Geothermal systems / Implementation / Industry /

Abstract by Author

The objective in this study was to determine the technical and economic feasibility of using low temperature geothermal energy (hot brines) in place of steam from conventional sources in the evaporation and crystallization industry. A survey of major industries was carried out in order to choose three industries that were significant users of energy, could utilize geothermal brine, and demonstrate the broad range of industrial evaporation and crystallization operations. The selected industries were the preserved fruit and vegetable, sugar and confectionary products, and chemical industries. From among each of the selected industries, an example case was chosen for technical and economic evaluation. This evaluation included use of the "feed-and-bleed" process for energy extraction from the low-temperature brine. This process was chosen as the best process to use because it provides one of the most efficient means of utilizing geothermal brine in

Geopressured Geothermal Bibliography

evaporation-crystallization operations. This study concludes that, under certain conditions, geothermal energy could be used economically in the evaporation and crystallization industry. The factors that would most affect cost include geothermal resource characteristics (well flow, temperature, and distance of transportation); the energy extraction process chosen (the feed-and-bleed process uses the least amount of brine); and the duration of the evaporation/crystallization process. A program to aid in implementing the use of geothermal energy is included.

117. GGIS-100002/0/ / 3/A/ // //

Title- Approximation of Pressures Ahead of the Bit by Analysis of the Exposed Pressure Seal

Author(s)- / Hebert , Rene / Harger , C. G. / Pertuis , J. B. /
Conference- Abnorm. Subsurf. Pressure
Baton Rouge
Louisiana
USA

Publication date- Vol. 3 , 1972
Pagination- Page 145 , 4 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Engineering geology / Geopressured reservoirs /
Overburden pressure / Pressure buildup / Geopressure /
Measurement / Techniques / Seals / Analysis / Boreholes /

118. GGIS-100023/J/ / 5812/A/ // //

Title- Aquathermal Fluid Migration

Author(s)- / Magara , K. /
Publisher- American Association of Petroleum Geologists
Journal- American Association of Petroleum Geologist Bulletin
Publication date- Vol. 58 , Issue 12 , 1974
Pagination- Page 2513 , 5 Pages

Descriptor(s)- / Geothermal gradients / Subsurface temperatures /
Water expansion / Water circulation / Geopressured systems /
Pressure gradients / Diagrams / Gulf Coast / Subsurface
pressures / Compaction / Aquathermal pressuring / Sedimentary
basins / Fluid mechanics / Pore pressure / Hydrostatic pressure /
Fracturing / Geology / Tables /

119. GGIS-100024/B/ / 11/A/ // //

Title- Aquathermal Pressuring

(Paper 10 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)

Subtitle- Role of Temperature in Development of Abnormal Pressure Zones

Author(s)- / Barker , Colin /
Publisher- American Association of Petroleum Geologists
Publication date- Vol. 11 , 1974

Pagination- Page 137 , 4 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Engineering geology / Geopressured reservoirs /
Overburden pressure / Geopressure / P-T conditions / Geothermal
gradient / Water / Interstitial water / Shale / Depth / United
States / Gulf Coast /

120. GGIS-100318/R/ / /M/ / / / /

Title- Areas of Ground Subsidence to Geofluid Withdrawl

Author(s)- / Grimsrud , G. Paul / Turner , Barbara L. / Frame ,
Phillip A. /

Publisher- California Univ., Berkeley. Lawrence Berkeley Lab.
Berkeley, Calif.

Publication date- August 1978

Pagination- 329 Pages

Report/patent- LBL--8618

Local Availability- CES

Sponsor- / U.S. Department of Energy
W-7405-ENG-48 /

Corporate Author- Systems Control, Inc.
Palo Alto , California , USA

Descriptor(s)- / California / Chocolate Bayou Geothermal field / Data
analysis / Environmental effects / Field studies / Fluid
withdrawal / Geopressured zones / Geysers geothermal field /
Ground subsidence / Hot water systems / Idaho / New Zealand /
Raft River KGRA / Texas / Vapor dominated systems / Wairakei
geothermal field /

Abstract by Author

The evaluation of the potential for subsidence of geothermal resource areas is an important consideration in resource development and exploitation. Subsidence, if it occurs, may cause a significant environmental impact as well as present problems in field operation. Consequently, methods for its prediction are required. Two approaches are currently available for predicting subsidence: the analysis method uses mathematical models; the analogy method relies on a subjective analysis and comparison of geological and hydrological features of the site under study in the past. The comparisons made in the analogy method thus require detailed information on sites which have already exhibited subsidence. This report provides such detailed information on four areas (Chocolate Bayou, Raft River Valley, Wairakei, and The Geysers geothermal fields) with histories of subsidence.

121. GGIS-100393/O/ / /A/ / / / /

Title- Assessing the Socioeconomic Impact of Geopressured Geothermal Energy Development in Coastal Louisiana: A Preliminary Report

Author(s)- / Grimes , Michael D. / Saucier , Deborah L. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1642 , 49 Pages

Geopressured Geothermal Bibliography

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Corporate Author- Louisiana State Univ.

Baton Rouge , USA

Auxiliary expression(s)-

Illus. / Graph (1) / Map (1) /

Table

Ref.

Descriptor(s)- / Calcasieu Parish / Cameron Parish / Comparative evaluations / Demography / Economic impact / Economics / Environmental impacts / Geopressure resources / Lafourche Parish / Louisiana / Models / Populations / Resource development / Social impact / Socio-economic factors / St Mary Parish / Terrebonne Parish / Vermillion Parish /

Abstract by Author

This paper reports the initial analysis of the potential socioeconomic impact of geopressured/geothermal energy development for parishes in coastal Louisiana containing five targeted development sites. After a wide variety of different indicators was reviewed, a set was selected to represent five different dimensions of the socioeconomic structure of the parishes. These dimensions are: (1) population size and composition, (2) education and training, (3) income and tax base, (4) labor-force composition, and (5) health-care and social services. Using these variables, baseline data profiles for each parish are constructed and compared to both state planning district and state totals. These profiles are then used as a benchmark for accessing the potential socioeconomic impact of a range of geopressured/geothermal energy development alternatives on the host parishes.

122. GGIS-100528/O/ / /A/ / / / /

Title- Assessment of the Injectability of Brines Produced by Geopressured-Geothermal Resources of the Gulf Coast

Author(s)- / Harrar , J.E. / Netherton , R. / Locke , F.E. / Owen , L.B. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 145 , 3 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-48 /

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (1) /

Table

Ref.

Descriptor(s)- / Brines / Brine treatment / Gulf Coast / Injectability
/ Testing / US DOE / Water quality / Well design /

Abstract by Author

A mobile, field test system has been developed for on-line evaluation of geopressured brine injectability at elevated pressures and temperatures. The apparatus consists of a flow system that is connected directly to the wellsite brine-handling equipment. The system permits injectability assessment on the basis of standard membrane filtration tests and an examination of the effects of brine aging by means of incubation tests. Auxiliary instrumentation are used to characterize the brine suspended solids. The test system is being used to diagnose water quality at the design wells of the U.S. Department of Energy.

123. GGIS-100546/R/ / /M/ / / / /

Title- Assessment of Emerging Energy Sources

(Summary Report)

Publication date- September 1981

Pagination- 43 Pages

Report/patent- EPRI-EA-2023-SY

Available- NTIS

Corporate Author- Booz, Allen and Hamilton, Inc.

Energy and Environment Div.

Bethesda , MD , USA

Descriptor(s)- / Commercialization / Comparative evaluations / Energy
sources / Energy yield / Evaluation / Forecasting / Potential
energy /

Abstract by NTIS

This report summarizes the results of a broad review and analysis of the commercialization potential for eight emerging sources of energy: tight gas sands; heavy oil; methane from geopressured aquifers; oil shale; enhanced oil recovery; advanced coal mining technologies; and underground coal gasification. Each source of energy or technology was evaluated with respect to six factors affecting commercialization: size and characteristics of resource; technical and economic performance; relevant energy market growth rates; logistical considerations; development lead times; and regulatory and institutional factors. The evaluation was based on a review of existing literature, extensive interviews with industry experts and Booz, Allen and Hamilton's overall assessment of the degree to which these factors would constrain commercial development. In addition, estimates were made of supply potential from each emerging energy. This report summarizes Booz, Allen and Hamilton's findings with respect to these factors.

124. GGIS-100231/R/ / /A/ / / / /

Title- Assessment of Geopressured Geothermal Resources, Texas Gulf Coast

Publication date- 1976

Pagination- Page 15 , 2 Pages

Geopressured Geothermal Bibliography

Available- Bureau of Economic Geology
University Station
Box X
Austin
Texas
78712)

Descriptor(s)- / Geothermal prospecting / Geothermal energy / Texas /
Continental shelf, offshore / Continental Shelf / Geopressure
exploration / Geopressure resources / Gulf Coast / Resource
assessment /

125. GGIS-100317/R/ / /A/ / / / /

Title- Assessment of Geopressured-Geothermal Resources in the
Northern Gulf of Mexico Basin

Author(s)- / Wallace , R.H., Jr. / Kraemer , T.F. / Taylor , R.E. /
Wesselman , J.B. /

Publisher- U.S. Geological Survey
Reston, Va.

Publication date- 1979

Pagination- Page 132 , 24 Pages

Report/patent- CIRC--790

Available- U.S. Geological Survey

Branch of Distribution

1200 South Eads St.

Arlington

Virginia

22202

(Paper Copy)

Local Availability- CES

Corporate Author- U.S. Geological Survey

Washington , D.C. , USA

Auxiliary expression(s)-

Illus. / Figure (10) /

Table

Ref.

Descriptor(s)- / Electric power / Elevated temperature / Energy yield
/ Fluid pressure / Geopressured systems / Geopressured zones /
Gulf Coast / Louisiana / Methane / Mississippi / Porosity / Power
potential / Resource assessment / Salinity / Sandstone / Shale /
Texas /

Abstract by Author

This report estimates the geopressured-geothermal energy contained in pore waters of sedimentary rocks to a depth of 22,500 ft (6.86 km) in the northern Gulf of Mexico basin, both onshore and offshore. The total thermal energy in waters of both sandstone and shale is estimated to be $107,000 \times 10^{18}$ J, of which $11,000 \times 10^{18}$ J is in sandstone and thus represents the amount from which initial production will be drawn. Assuming saturation of the water with methane, the total methane dissolved in water within sandstone and shale is $59,000 \times 10^{12}$ standard cubic feet. Of this, $5,700 \times 10^{12}$ standard cubic feet, equivalent to $6,000 \times 10^{18}$ J of thermal energy, is contained in water within sandstone. Application of the recoverability analysis presented by Papadopoulos and others (1975) in USGS Circular 726 suggests that recoverable thermal energy ranges

from 270×10^{18} J under plan 3 (controlled development with limited pressure reduction and subsidence) to $2,800 \times 10^{18}$ J under plan 2 (depletion of reservoir pressure). The energy equivalent of recoverable methane ranges from 158×10^{18} J under plan 3 to $1,640 \times 10^{18}$ J under plan 2. The electricity producible from this thermal energy at a conversion efficiency of 8 percent ranges from 23,000 MWe for 30 years under plan 3 to 240,000 MWe for 30 years under plan 2. As in Circular 726, the Dissolved methane is not considered to be used locally, and, accordingly, no electrical energy is calculated.

126. GGIS-100094/ / / /M/ / / / /

Title- Assessment of Geothermal (Geopressure) Resources in the Texas Gulf Coast Region
(3/75 to 3/76)

Author(s)- / Dorfman , M. H. / Groat , C. / Fisher , W. L. / Bebout , D. G. /

Publication date- 1975

Note- Estimated Calendar Year Funding Reported as 1975 \$250,000

Available- University of Texas, School of Engineering

University of Texas

School of Engineering, Petroleum Engineering

200 W. 21ST

Austin, Texas 78712

Corporate Author- U.S. National Science Foundation

Descriptor(s)- / Geological setting / Geopressure resources /
Geopressured reservoirs / Geothermal fluids / Gulf Coast /
Resource assessment / Sediments / Stratigraphy / Texas /

Abstract by Energyline

Abstract by Energyline

The primary objective of this research is to evaluate the methodology of subsurface geologic reconstruction in terms of its applicability to the assessment of geothermal fluids in sedimentary terrains. The technology, featuring a genetic stratigraphic approach to basin analysis, has proven successful in South Texas for geopressured reservoir sand delineation. The proposed research will expand this depositional settings. Successful completion will provide a work into the appropriate sediments throughout the Texas Coastal Zone and will test the approach in differing depositional settings. Successful completion will provide a valuable tool for geothermal resource assessment in other geopressured settings and in hot brine areas as well as in the Gulf Coast area.

127. GGIS-100142/R/ / /M/ / / / /

Title- Assessment of Geothermal Energy Sources

Author(s)- / Peck , D. L. /

Publication date- June 1972

Pagination- 94 Pages

Report/patent- PB-224 882

Note- 94 P., 9 P. Bibliography

Available- NTIS

Geopressured Geothermal Bibliography

(Paper copy)

(Microfiche)

Corporate Author- U. S. Department of the Interior
Panel on Geothermal Energy Resources
D.C. , USA

Descriptor(s)- / Environmental effects / Geothermal energy /
Recommendations / Research programs / Resource assessment / Uses
/

Abstract by NSF/RANN

Preliminary recommendations for research and development in the field of geothermal energy are presented. A 5-year federal program is suggested to assess the magnitude, type, and location of U.S. geothermal resources and to encourage development of technology for discovering, evaluating, and utilizing the resources. Included in the report are discussions of the nature of geothermal energy, current utilization, current research and development, environmental effects, ultimate potential, and research and development needs. (MPG)

128. GGIS-100317/R/ / /M/ // //

Title- Assessment of Geothermal Resources of the United States--1978

Author(s)- / Muffler , L.J.P. /

Publisher- U.S. Geological Survey
Reston, Va.

Publication date- 1979

Pagination- 163 Pages

Report/patent- CIRC--790

Available- U.S. Geological Survey

Branch of Distribution

1200 South Eads St.

Arlington

Virginia

22202

(Paper Copy)

Local Availability- CES

Corporate Author- U.S. Geological Survey

Washington , D.C. , USA

Auxiliary expression(s)-

Illus. / Figure (27) / Map (3) /

Table

Descriptor(s)- / Elevated temperature / Geopressured systems /
Geopressured zones / Geothermal resources / Hot dry rock systems
/ Hydrothermal systems / Low temperature / Magma systems /
Methane / Moderate temperature / Resource assessment / USA /

Abstract by Author

The geothermal resource assessment presented in this Circular is a refinement and updating of USGS Circular 726. Nonproprietary information available in June 1978 is used to assess geothermal energy in the ground and, when possible, to evaluate the fraction that might be recovered at the surface. Five categories of geothermal energy are discussed: (a) conduction-dominated regimes; (b) igneous related geothermal systems; (c) high-temperature (>150 DEG C) and intermediate-temperature (90 DEG-150 DEG C) hydrothermal convection systems; (d) low-temperature (<90 DEG C) geothermal waters; (e)

geopressured-geothermal energy (both thermal energy and energy from dissolved methane). Assessment data are presented on three colored maps prepared in cooperation with the National Oceanic and Atmospheric Administration.

129. GGIS-100121/R/ / /M/ / / / /

Title- Assessment of Geothermal Resources of the United States, 1975
(Geological Survey Circular No, 726)

Author(s)- / White , D. E. / Williams , D. L. /

Publisher- U.S. Geological Survey
Reston, Virginia

Publication date- 1975

Pagination- 159 Pages

Report/patent- CIRC--726

Corporate Author- U.S. Geological Survey
Washington , D.C. , (USA)

Descriptor(s)- / United States / Economic geology / Geothermal energy / Resources / Regional / Hydrothermal / Magmas / Geopressure / Convection / Conduction / Production / Geothermal resources / Hydrothermal convection systems / Geopressured systems / Geothermal wells / Hot dry rock systems / Geothermometry / Evaluation / Arizona / California / Idaho / Louisiana / New Mexico / Nevada / Texas / Oregon / Washington / Imperial Valley / Maps / Tables / Diagrams /

Abstract by GGIS

Six sections are presented along with an introduction, a summary discussion, and conclusions. A separate abstract is prepared for the section on geopressured geothermal resources

130. GGIS-100528/O/ / /A/ / / / /

Title- Assessment of In-Place Solution Methane in Tertiary Sandstones
(Technical Note)

Subtitle- Texas Gulf Coast

Author(s)- / Gregory , A.R. / Dodge , M.M. / Posey , J.S. / Morton , R.A. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 25 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy
DE-AC08-78ET11397 /

Auxiliary expression(s)-

Illus. / Figure (1) / Map (1) /

Table

Ref.

Descriptor(s)- / Dissolved gases / Electrical logging / Energy sources / Geopressure resources / Gulf Coast / Methane / Regional analysis / Sandstone / Tertiary period / Texas / Well logging / Wilcox Formation /

Abstract by Author

The higher prices obtained for commercial natural gas in recent years have stimulated interest in methane saturated formation waters of sandstone reservoirs in the Texas Gulf Coast as a potential alternative source of energy. The objective of this project was to appraise the total volume of in-place methane dissolved in formation waters of deep sandstone reservoirs of the onshore Texas Gulf Coast within the stratigraphic section extending from the base of significant hydrocarbon production (8,000 ft) to the deepest significant sandstone occurrence. Factors that must be evaluated to determine the total methane resource are reservoir bulk volume, porosity, and methane solubility. The latter is controlled by the temperature, pressure, and salinity of formation waters. Regional assessment of the volume and distribution of potential sandstone reservoirs was made from a data base of 880 electrical well logs, from which a grid of 24 structural dip cross sections was constructed. These cross sections extend from near the Wilcox outcrop to the coastline. Reservoir bulk volume was determined by mapping the structural and stratigraphic framework of Tertiary sandstone units. Structural and stratigraphic boundaries were used to divide the Texas Gulf Coast into 24 subdivisions. Methane content in each of nine formations or divisions of formations was determined for each subdivision. The total in-place methane for Tertiary sandstones below 8,000 ft in the Texas Gulf Coast was found to be 690 TCF. The total in-place methane for "effective" Tertiary sandstones (sandstone units greater than 30 ft thick) below 8,000 ft was 325 TCF.

131. GGIS-100121/R/ / /A/ / / / /

Title- Assessment of Onshore Geopressured-Geothermal Resources in the Northern Gulf of Mexico Basin

(Chapter 6 in Assessment of Geothermal Resources of the United States, 1975)

Author(s)- / Papadopoulos , S. S. / Wallace , R. H. / Wesselman , J. B. / Taylor , R. E. /

Publisher- U.S. Geological Survey
Reston, Virginia

Publication date- 1975

Pagination- Page 125 , 22 Pages

Report/patent- CIRC--726

Corporate Author- U.S. Geological Survey
Washington , D.C. , USA

Auxiliary expression(s)-

Illus. / Graph (4) / Map (1) / Table (5) /
Refs.

Descriptor(s)- / Energy sources / Energy yield / Geopressured systems / Geothermal resources / Gulf of Mexico / Hydraulics / Kinetic energy / Louisiana / Methane / Texas / Geothermal energy / Geo brine / United States South / Economic geology / Geopressure / Natural gas / Coastal / United States / Resources / Possibilities / Production / Economics / Thermal waters / Aquifers / P-T conditions / Salinity / Ground water / Thickness / Permeability / Porosity /

Abstract by Energyline

Geopressured zones in the Northern Gulf of Mexico Basin are known to occur in Tertiary sediments beneath an area over 278,500 SQ. KM., extending from the Rio Grande in Texas northeastward to the mouth of the Pearl River in Louisiana. The resource potential of geopressured-geothermal reservoirs within the onshore part of Tertiary sediments under an area of more than 145,000 SQ. KM. along the Texas and Louisiana Gulf Coast is assessed. The study area is divided into subareas, with the geopressured zone in each area idealized as a "conceptual reservoir". The recoverability of energy from geopressured reservoirs ultimately depends on the amount of water that can be produced by wells tapping these reservoirs. Various development plans for recovering the energy are discussed. (4 graphs, 1 map, 21 references, 5 tables)

132. GGIS-100477/R/ / /M/ / / / /

Title- Assessment of Potential Environmental Impacts of Geopressured Methane Development

(Final Report for 1979)

Author(s)- / Golabi , Kamal /

Publication date- March 1980

Pagination- 300 Pages

Report/patent- PB80-210701

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRI-5104-321-0182 /

Corporate Author- Woodward-Clyde Consultants

San Francisco , CA , USA

Descriptor(s)- / Air pollution / Commercialization / Constraints / Ecology / Economic impact / Energy source development / Environmental impacts / Gas production / Geopressure resources / Geothermal brines / Ground subsidence / Liquid wastes / Methane / Natural gas deposits / Noise pollution / Recommendations / Regulations / Seismology / Social impact / Waste disposal / Water pollution /

Abstract by ERA

This study presents a critical examination of available information on the characteristics of geopressured methane resources. It identifies and assesses potential environmental impacts and regulatory constraints that may influence the development and commercial use of the resource, and defines issues unique to geopressured methane development. Finally, the study provides a list of recommendations for planning future research efforts.

133. GGIS-100323/R/ / /M/ / / / /

Title- Assessment of Subsurface Salt Water Disposal Experience on the Texas and Louisiana Gulf Coast for Applications to Disposal of Salt Water from Geopressured Geothermal Wells.

Author(s)- / Knutson , C.F. / Boardman , C.R. /

Geopressured Geothermal Bibliography

Publication date- August 4, 1978

Pagination- 80 Pages

Report/patent- NVO-1531-2

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U.S. Department of Energy

EY-77-C-08-1531 /

Corporate Author- GeoEnergy Corp.

Las Vegas , Nevada , USA

Descriptor(s)- / Brines / Geothermal fluids / Geothermal wells /
Injection wells / Bibliographies / Coastal regions / Data /
Geopressured systems / Government policies / Gulf of Mexico /
Liquid wastes / Louisiana / Tables / Texas / Waste disposal /
Wells /

Abstract by TIC

A representative cross section of the literature on the disposal of geothermal brine was perused and some of the general information and concepts are summarized. The following sections are included: disposal statistics--Texas Railroad Commission; disposal statistics--Louisiana Office of Conservation; policies for administering salt water disposal operations; salt water disposal experience of Gulf Coast operators; and Federal Strategic Petroleum Reserve Program's brine disposal operations. The literature cited is listed in the appended list of references. Additional literature is listed in the bibliography.

134. GGIS-100470/R/ / /M/ / / / /

Title- Assessment of Surface Geophysical Methods in Geothermal
Exploration and Recommendations for Future Research

Author(s)- / Goldstein , N.E. / Norris , R.A. / Wilt , M.J. /

Publication date- April 1978

Pagination- 165 Pages

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C. (USA). Div. of
Geothermal Energy

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Berkeley Lab.

Berkeley , USA

Auxiliary expression(s)-

Illus. / Diagram (7) /

Table

Ref.

Descriptor(s)- / Faults / Geophysical surveys / Geothermal
exploration / Geysers geothermal field / Magma /
Microearthquakes / Noise / Rayleigh waves / Recommendations /
Seismic P waves / Seismic reflection surveys / Seismic
refraction surveys / Seismic S waves / Seismic surveys / Wave
propagation /

Abstract by Author (revised)

The objective of this report is to provide the Division of Geothermal Energy of the U.S. Department of Energy with a document to assist in guiding research planning in geothermal exploration technology for the short run. Research planning goals are to make geophysical exploration more effective on a scientific basis and more cost-effective on a practical basis. This study identifies gaps in specific areas of surface geophysical technology and formulates research problems and solutions that are needed to correct these deficiencies. Four general classes of surface geophysical methods were investigated: active seismic; passive seismic; natural field electrical and electromagnetic; and controlled-source electrical and electromagnetic.

135. GGIS-100155/J/ / 492/A/ / / / /

Title- Assignment: Drill and Complete a 'Water Well'

(Hot, geopressured brines with entrained gas may lure big rigs to new duty on the Gulf Coast. Here is how resulting wells can be drilled and equipped.)

Subtitle- Depth: 12,000 to 20,000+ Ft., Pressure: 9000 to 15,000+ Lb., Temperature: 250 to 350 DEG f

Author(s)- / Boyd , W. E. / Dorfman , M. H. /

Journal- Drilling

Publication date- Issue 492 , March 1978

Pagination- Page 30 , 4 Pages

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (1) /
Table

Descriptor(s)- / Detection / Electrical logging / Formation fracture gradients / Geopressure / Geopressured wells / Gravel packing / Safeguards / Sand control / Well casings / Well completion / Well head equipment / Well perforating /

Abstract by GGIS

The technology which can be used to drill and complete wells which tap the geothermal-geopressured resources of the Gulf Coast is discussed, including wellhead equipment, drilling safeguards, geopressure detection, formation fracture gradients, well casings, perforating procedures, completion procedures, and sand control.

136. GGIS-100054/J/ / 1201/A/ / / / /

Title- Association of Salinity and Geopressures in Soft and Hard Rock

Author(s)- / Fertl , W. H. / Timko , D. J. /

Journal- Log Analyst

Publication date- Vol. 12 , Issue 1 , January 23 , 1971

Pagination- Page 5 , 11 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Oil fields / Brines / Oil wells / Bottom hole pressure / Well logging / Geochemistry / Salinity /

Abstract by NTIS

Geopressured Geothermal Bibliography

In situ and surface measurements of salinity variations in formations penetrated by the drill bit can be conducted. Experience in soft and hard rock country indicates that changes in salinity are related to environmental conditions and tectonic features. Of importance is the evidence that such salinity variations appear to be related to the occurrence of overpressured formations (geopressures). However, such correlation may be limited by the fact that formation salinities can vary quite markedly with rock stresses due to tectonics such as faulting, salt dome uplift, unconformities, and other local or regional geology. 39 refs.

137. GGIS-100528/O/ / /A/ / / / /

Title- Atmospheric and Radiogenic Noble Gases in Geopressured-Geothermal Fluids

Author(s)- / Mazar, Emanuel / Kharaka, Yousif K. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981.)

Publication date- 1981

Pagination- Page 197, 4 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (1) /

Table

Ref.

Descriptor(s)- / Fluids / Gases / Geothermal brines / Gulf of Mexico / Reservoir fluids /

Abstract by GGIS

Noble gas studies of natural gases and co-produced brines present in geopressured systems have been computed. Objectives of this study are to: determine the recognizability of atmospheric noble gases; identify the kinds of radiogenic noble gases present, and investigate the modes of partitioning that occur between the gas and fluid phases.

138. GGIS-100023/J/ / 5704/A/ / / / /

Title- Attainment

(Abstract)

Subtitle- A Major Fractured and Overpressured Trap

Author(s)- / Lucas, P. Peter T. /

Publisher- American Association of Petroleum Geologists

Journal- American Association of Petroleum Geologist Bulletin

Publication date- Vol. 57, Issue 4, 1973

Pagination- Page 791, 1 Pages

Descriptor(s)- / Wash / Oil and gas fields / Petroleum / Engineering geology / Testing / Tertiary / Fractures / Economic geology / United States / Geopressured reservoirs / Patterns / Uinta Basin / Production / Geopressure / Traps / Stratigraphic /

 139. GGIS-100573/B/ / /M/ / / / /

Title- Authigenic Cements Related to the Geopressured Zone of the Manchester Field , Louisiana

Author(s)- / Kirst , T.L. /

Publication date- 1977

Descriptor(s)- / Geopressured zones / Louisiana / Mineral deposits /

140. GGIS-100407/O/ / /A/ / / / /

Title- Autohydrolysis

Subtitle- A Process System for Utilizing Geothermal Fluids in
 Converting Lignocellulose Biomass to Alcohol Fuels

Author(s)- / Schmitt , R.C. / Murphy , V.G. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal
 Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 609 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasek W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (1) /

Ref.

Descriptor(s)- / Biomass / Comparative evaluations / Economics /
 Energy conversion / Experimental results / Fuels / Geothermal
 energy / Geothermal fluids / Geothermal resources / Laboratory
 studies / Liquids / Recovery processes / Synthetic fuels / Waste
 processing /

Abstract by GGIS

Conversion of biomass to liquid fuel is practical only if the economics can be improved. This research proposes that coupling lignocellulosic biomass with a geothermal heat conversion process improves the conversion economics so as to be a viable procedure. Lignocellulosic materials that might be used in conversion include algae, corn stalk, wheat straw and forest residues. This process is attractive because not only are waste materials being converted to fuel, but also because geothermal energy is, in effect, being converted to a transportable fuel. Results show the process is relatively low in temperature and is compatible with many geothermal resources.

141. GGIS-100298/ / / /M/ / / / /

Title- Automatic History Matching of Geopressured-Geothermal Reservoir Performance Data by use of Optimal Control Theory

Author(s)- / Elemo , Rufus Oladipo /

Publication date- 1978

Pagination- 344 Pages

Descriptor(s)- / Compaction / Fluid flow / Geopressured reservoirs / Geopressured systems / Mathematical models / Performance testing / Permeability / Porosity / Productivity / Thickness /

Abstract by Dissertation Abstracts

Three of the pertinent parameters of stress-sensitive, geopressured-geothermal reservoir systems have been singly and jointly estimated. The method of History Matching was applied because studies showed that the current conventional well test methods for determining the mathematical petroleum reservoir models' unknown parameters are not suitable for determining the initial values of the parameters in stress-sensitive reservoirs such as the geopressured-geothermal reservoir systems. Numerically controlled experiments indicated that the temporal response of geopressured-geothermal reservoirs pressure is sensitive to permeability, uniaxial compaction coefficient, net pay thickness, specific productivity index and, in a much less degree, to porosity. Based on these results, stress-sensitive permeability (distributions in homogenous and heterogenous reservoirs), uniaxial compaction coefficient and porosity were considered for estimation. A hypothetical reservoir with a single-phase slightly compressible fluid flowing in two dimensions was assumed for testing. There are no real data from geopressured-geothermal reservoir at this time, hence the history data was model-generated with simulated measurement errors. Three different types of data were simulated: drawdown data and two different combinations of drawdown and buildup data. The results showed that the stress-sensitive parameters can be estimated by history matching. The single-parameter estimates were most reliable; reliability decreases as the number of unknown parameters increases. Drawdown data are generally preferred to drawdown-buildup data and error-free data are also desirable.

142. GGIS-100058/J/ / /A/ / / / /

Title- AGA-

Subtitle- Supplemental Gas to Bolster U.S. Supply

Publication date- Vol. 77 , Issue 31 , July 30 , 1979

Pagination- Page 120 , 2 Pages

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (1) /

Descriptor(s)- / Gas production / Geopressure resources / Natural gas / Natural gas deposits /

Abstract by PROMPT

Conventional gas output in the continental U.S. will be 14-18 tcf/yr in 1985 and 12-14 tcd/yr in 2000, according to the

American Gas Association. Output from supplemental gas sources will rise to over 17 tcf/yr by 2000, with the majority coming from Alaskan pipeline gas, LNG and coal gasification. By 2000, other gas sources will come on stream, including Devonian shale, geopressed gas, land and marine biomass and renewable urban wastes.

143. GGIS-100528/O/ / /A/ / / / /

Title- Background and Status of the Sweet Lake Geopressed-Geothermal Test, Cameron Parish, Louisiana
Author(s)- / Durham, C.O. /
Conference- Fifth Conference on Geopressed-Geothermal Energy (October 13, 1981)
Publication date- 1981
Pagination- Page 295, 3 Pages
Local Availability- GGIS
Local Availability- CES
Auxiliary expression(s)-
 Illus. / Figure (1) /
 Ref.
Descriptor(s)- / Cameron Parish / Feasibility studies / Geopressed wells / Geothermal wells / Gulf Coast / Louisiana / Performance testing /
Abstract by GGIS
 An introduction to papers on the Sweet Lake geopressed-geothermal test is presented.

144. GGIS-100386/R/ / /M/ / / / /

Title- Basic Research Needed for the Development of Geothermal Energy
Author(s)- / Aamodt, R. Lee / Riecker, Robert E. /
Publication date- October 1980
Pagination- 19 Pages
Report/patent- LA-8562-MS
Available- NTIS
 (Paper copy)
 (Microfiche)
Local Availability- CES
Sponsor- / Department of Energy, Washington, DC (USA). Office of Basic Energy Sciences
 W-7405-ENG.36 /
Corporate Author- Los Alamos Scientific Lab.
 NM, USA
Auxiliary expression(s)-
 Illus. / Graph (1) /
 Table
 Ref.
Descriptor(s)- / Convection / Energy source development / Geopressed systems / Geothermal exploration / Heat flow / Hydrothermal systems / Research programs / Rock fluid interactions / Thermal conductivity /
Abstract by Author

Geopressed Geothermal Bibliography

This report was prepared for the Office of Basic Energy Sciences of the U.S. Department of Energy. The purpose of the report is to identify basic research needed to facilitate development of geothermal energy. An attempt has been made to make the report representative of the ideas of productive workers in the field. The plan of the report is to discuss the present state of knowledge of geothermal energy and then to list specific recommendations for further research, with status and priorities. Discussion is limited to a small number of applicable concepts, namely: 1) origin of geothermal flux, 2) transport of geothermal energy, 3) geothermal reservoirs, 4) rock-water interactions, and 5) geophysical and geochemical exploration.

145. GGIS-100175/J/ / /A/ / / / /

Title- Basin Geology and Exploration--

Subtitle- Australia, New Zealand

Author(s)- / Evans , P.R. / McQuillan , H. / Devine , S. Bevan / Shibaoka , M. / Nyein , R. Kyaw / Smith , J. W. / King , David /

Journal- APEA J.

Publication date- Vol. 17 , Issue 1 , 1977

Pagination- Page 42 , 63 Pages

Corporate Author- New South Wales Univ.

Kensington , Australia

Auxiliary expression(s)-

Table

Ref.

Illus. / Figure (31) / Graph (18) / Map (26) /

Descriptor(s)- / Australia / Diagenesis / Geology / Geopressure exploration / Geopressed zones / Hydrocarbons / Natural gas fields / Petroleum exploration / Sandstone / Sedimentary basins / Seismic surveys /

Abstract by Energyline

Basin geology and exploration in Australia and New Zealand is discussed in eight papers on the following topics; petroleum geology of western New South Wales; sandstone reservoir geometry of non-marine sediments in the Toolachee gas field; pattern of diagenesis in some Australian sedimentary basins; occurrence, prediction, and control of geopressures on the northwestern shelf of Australia; the special roles of stable isotopes in assessing hydrocarbon occurrences; a seismic survey in the Copper Basin in Queensland; application of semi-automated and interactive magnetic interpretation techniques in petroleum exploration; and hydrocarbon potential of the north Wanganui Basin, New Zealand.

146. GGIS-100407/O/ / /A/ / / / /

Title- Beginnings of Geothermal Impact on County Population and Leadership, Imperial County, California

Author(s)- / Pick , James B. / Butler , Edgar W. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City
 Utah
 USA (September 9 , 1980)
 Publisher- Geothermal Resources Council
 Davis, CA
 Publication date- Vol. 4 , 1980
 Pagination- Page 815 , 4 Pages
 Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasei W. Roberts
 Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 CA
 95616
 Local Availability- GGIS
 Auxiliary expression(s)-
 Illus. / Map (1) /
 Ref.
 Descriptor(s)- / California / Commercialization / Communities /
 Demography / Development / Employment / Field studies /
 Geothermal industry / Geothermal power plants / Human
 populations / Imperial County / Management / Personnel /
 Socio-economic factors /
 Abstract by GGIS
 Imperial County, California is experiencing the early stages
 of geothermal energy development as a geothermal power plant is
 readied for operation in 1983. The socioeconomic impacts of
 energy development on the county population (and especially the
 leadership structure) has been studied and conclusions are
 presented in this article.

 147. GGIS-100533/0/ / /A/ // //

Title- Benefit Analysis for Geothermal Log Interpretation
 Author(s)- / Rigby , F.A. /
 Conference- Sixth Workshop on Geothermal Reservoir Engineering (
 December 16 , 1980)
 Publisher- Stanford Geothermal Program, Stanford University
 Stanford, CA
 Publication date- 1980
 Pagination- Page 310 , 6 Pages
 Local Availability- GGIS
 Corporate Author- Science Applications, Inc.
 Bellevue , WA , USA
 Auxiliary expression(s)-
 Ref.
 Table
 Descriptor(s)- / Cost benefit analysis / Development / Economics /
 Field studies / Formation testing / Geophysical exploration /
 Geothermal drilling / Geothermal exploration / Geothermal
 reservoirs / Geothermal wells / Information needs / Reservoir
 properties / Temperature / Temperature gradients / Well logging
 /
 Abstract by GGIS
 Potential near-term benefits from a program of developing
 new log interpretation techniques in geothermal wells by

Geopressured Geothermal Bibliography

adapting techniques used in hydrocarbon reservoirs is analyzed. Because of the different demands of geothermal development from oil and gas production, new data requirements emerge and are discussed.

148. GGIS-100241/O/ / /A/ / / / /

Title- Bibliography

Author(s)- / Tarlock , A. D. / Waller , R. L. /

Conference- Geothermal Resources Development Institute Conference

Salt Lake City

Utah

USA (January 27 , 1977)

Publisher- Rocky Mountain Mineral Law Foundation

Boulder, CO

Publication date- January 27 , 1977

Report/patent- CONF-770135--

Descriptor(s)- / Bibliographies / Geothermal resources / Laws / Legal aspects / Regulations /

Abstract by TIC

A geothermal bibliography is presented that is primarily composed of legal terms. (MHR)

149. GGIS-100308/O/ / /A/ / / / /

Title- Binary Cycle Expander for Geothermal Power Generation

Author(s)- / Kennelly , James R. / Geary , Carl H. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 367 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Elliott Co.

Jeannette , Pennsylvania , USA

Auxiliary expression(s)-

Illus. / Diagram (3) / Photo (1) /

Table

Descriptor(s)- / Binary cycle power generation / Elevated temperature / Geothermal energy conversion / Turbines / Working fluids / 2-methylpropane /

Abstract by Author

A 50 megawatt hydrocarbon expander turbine was designed with an actual mechanical limit of approximately 80 MWE. The design pressures of 34 bar (500 PSIA) inlet and 13 bar (200 PSIA) exhaust were based on a mixture of iso-butane and iso-pentane.

Inlet temperature is 149 DEG C (300 DEG F). The turbine is capable of being directly coupled to a two-pole 3600 R/S (3600 RPM) AC generator. The expander casing is a single body, vertically split barrel. Internal access and rotor removal are through the end opposite the drive end. The double flow rotor configuration has three expansion stages in each of the two flow paths. The flexible shaft design operates between the first and second critical speeds. Mechanical contact seals contain the hydrocarbon under all operating and shutdown conditions. The turbine design incorporates already developed components with operating experience.

150. GGIS-100995/ / / /A/ / / / /

Title- Busbar Economics of Liquid-Dominated Geothermal Power

Author(s)- / Wassenaar , Johan A. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 703 , 5 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (8) /

Descriptor(s)- / Cost / Economics / Electric power / Geothermal energy conversion / Geothermal power plants / Geothermal resources / Power generation / Reservoir properties /

Abstract by Author(rev.)

The state-of-the-art of electrical power generation using hot-water geothermal resources as opposed to geothermal steam, has yet to be developed to where an accurate prognosis of busbar cost can be made. This paper discusses the following main causes of uncertainty about the cost of hot-water geothermal power: (1) plant utility (availability) factor; (2) conversion cycle efficiency; (3) fuel (heat) price; (4) capital cost; (5) resource decay characteristics; (6) plant cooling provisions (7) operations and maintenance cost (O & M); (8) power transmission cost.

151. GGIS-100049/J/ / 10/A/ / / / /

Title- Calculation of Commercial Reserves of Thermal Water in a Pressurized System, with Examples from the Caucasian Foreland

Author(s)- / Polevoy , S. L. / Kovshov , I. V. /

Journal- Izv. Vyssh. Uchebn. Zaved. Geol. Razved.

Publication date- Issue 10 , 1968

Pagination- Page 79 , 7 Pages

152. GGIS-100148/R/ / /M/ / / / /

Title- Calculation of Geothermal Power Plant Cycles Using Program GEOTHM

Author(s)- / Green , M. A. / Pines , H. A. /

Publication date- May 1975

Pagination- 33 Pages

Report/patent- LBL-3238

Available- NTIS

(Paper copy)

(Microfiche)

Corporate Author- California University, Berkeley

Lawrence Berkeley Laboratories

Berkeley , California , USA

Descriptor(s)- / Ammonia / Binary cycles / Computer codes / Design / Energy yield / Flashed steam systems / G codes / Geothermal power plants / Mathematical models / Optimization / Thermodynamics / Total flow systems / Working fluids / 2-methylpropane / Noncondensable gases /

Abstract by NTIS

Program GEOTHM, a thermodynamic process program under development at the Lawrence Berkeley Laboratory, can be used to calculate the thermodynamic characteristics of geothermal power plant cycles. The computer program has been used to model some of the major geothermal power plant cycles. These include: (1) flashed steam cycles, (2) two-phase expander cycles, and (3) bi-fluid or binary cycles. The program will design the power plant thermodynamically (for example, it calculates pump and turbine ratings and heat exchanger area), and it can be used to model off-design operation of the plant. The paper includes three examples of program GEOTHM's capabilities: (1) a study of the electrical energy yield per unit well flow in bi-fluid cycles using ammonia, R-22, isobutane, and R-113 as a function of turbine inlet temperature and pressure is presented; (2) the change in power plant yield in bi-fluid cycles using ammonia and isobutane as the brine heat exchanger U factor changes is shown; and (3) the effect of noncondensable gases on the optimum performance of flashed steam and two-phase expander power plants is calculated.

153. GGIS-100472/R/ / /M/ / / / /

Title- Capital Cost Models for Geothermal Power Plants and Fluid Transmission Systems

Author(s)- / Schulte , S.C. /

Publication date- September 1977

Pagination- 51 Pages

Report/patent- PNL-2307

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

EY-76-C-06-1830 /

Corporate Author- Batelle Pacific Northwest Labs.

Richland , WA , USA

Auxiliary expression(s)-

Illus. / Graph (9) / Diagram (3) /

Table
Ref.

Descriptor(s)- / Capital / Comparative evaluations / Computer codes /
Computerized simulation / Cost / Design / Geothermal power
plants / Models / Planning / Simulation / Site selection /

Abstract by Author (revised)

The cost models specifically associated with the piping transmission systems, power plants (binary and flashed steam cycle), heat rejection systems, and switchyards are described in this report. Included are descriptions of facility components, analyses of cost variances, and comparisons with other cost estimates. Design assumptions, the categorization of facility components, and the basis for the cost models are also described. The variance analysis discusses the accuracy of GEOCOST (a simulation model for evaluating the economies of developing geothermal resources) estimates. In addition, GEOCOST calculated costs are compared with actual geothermal facility cost estimates to establish the validity of the models. All costs are in January 1977 dollars.

154. GGIS-100548/R/ / /M/ / / / /

**Title- Case Study Base Companion Report 3 to Simulation of
Geothermal Subsidence**

Author(s)- / Miller , I. / Dershowitz , W. / Jones , K. / Myer , L.
/ Roman , K. /

Publication date- March 1980

Pagination- 76 Pages

Report/patent- GSRMP-9

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)
W-7405-ENG-48 /

Corporate Author- Golder Associates, Inc.
Kirkland , WA , USA

Descriptor(s)- / Austin Bayou Project / Geysers Geothermal Field /
Ground subsidence / Information systems / Simulation / Wairakei
Geothermal Field /

Abstract by NTIS

The data base developed for selection and evaluation of geothermal subsidence case studies is presented. Data from this data base were used in case studies of Wairakei, the Geysers, and Austin Bayou Project.

155. GGIS-100160/R/ / /M/ / / / /

Title- Cementing of Geothermal Wells

Subtitle- Progress Report No. 4, January-March 1977

Author(s)- / Steinbeg , M. / Kukacka , L. E. /

Publication date- 1977

Pagination- 14 Pages

Report/patent- BNL-50657

Available- NTIS

(Paper copy)
(Microfiche)

Geopressured Geothermal Bibliography

Corporate Author- Brookhaven National Lab.

Upton , New York , USA

Descriptor(s)- / Geothermal wells / Materials testing / Polymers /
Well cementing /

Abstract by ERA

A coordinated program for the development of improved cements specifically designed for geothermal well applications was continued. Polymer cements (PC) have been identified as promising well cementing materials. Tests indicate that at temperatures above 218 DEG C (425 DEG F) only PC materials containing mixtures of silica and Portland cement are durable to brine and steam. Differential thermal analysis (DTA) studies are underway to determine the reason. Tests are also being conducted on two monomer systems that may further extend the operating temperature range.

156. GGIS-100528/O/ / /A/ / / / /

Title- Chemical Analysis of Gas and Brine from MGT-DOE Sweet Lake
Design Well

Author(s)- / Karkalits , O.C. / Hankins , B.E. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 331 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-79ET-27112 /

Auxiliary expression(s)-

Illus. / Graph (4) /

Table

Ref.

Descriptor(s)- / Brines / Chemical analysis / Fluid flow /
Geopressured reservoirs / Geothermal reservoirs / Production
testing / US DOE / Well design /

Abstract by Author

The MGT-DOE Sweet Lake well is one of the design wells funded by the Department of Energy. Four such wells should be in operation before the end of 1981. Three of the wells are located in Louisiana and one in Texas. The purpose of the design wells is to demonstrate the productivity of a geopressure-geothermal reservoir for a minimum of two years under reasonable steady flow conditions at 30,000 - 40,000 barrels per day flow rate. Presumably, all of the wells have been located by careful geological studies so they have no nearby boundaries or dislocations that would impede the flow of the brine to the well bore. McNeese State University is a sub-contractor to the Magma Gulf-Technadril Company to perform chemical analyses of the brine and gas separated therefrom. The data reported in this paper are for operations from the beginning of flow in June, 1981 through mid-July, 1981. The data also are limited to samples of gas and brine taken from a 27-foot aquifer with perforations between 15,387 and 15,414 feet depth. The testing plan called for perforating the next lower sand (40 feet net) with

perforations between 15,462 and 15,502 feet depth shortly after this paper was written.

157. GGIS-100308/O/ / /A/ // //

Title- Chemical Analysis of Water from the World's First Geopressured-Geothermal Well

Author(s)- / Hankins , B.E. / Chavanne , R.E. / Ham , R.A. / Karkalits , O.C. / Palermo , J.I. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 253 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

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95616

Local Availability- CES

Corporate Author- McNeese State University

Lake Charles , Louisiana , USA

Auxiliary expression(s)-

Table

Illus. / Diagram (1) /

Ref.

Descriptor(s)- / Chemical analysis / Chemical composition / Geopressured wells / Louisiana / Vermillion Parish / Water chemistry /

Abstract by Author(rev.)

This paper focuses on the chemical analyses of geopressured water from an abandoned gas well, the Edna Delcambre No. 1 Well, Tigre Lagoon Field, East Vermilion Parish, Louisiana. Because this project will serve as a prelude to testing other wells in different sections of the Texas-Louisiana Gulf Coast, it is important to answer these questions about the water's chemical composition: 1. Are noxious components (H (sub 2) S, NH (sub 3), boron compounds, radioactive species, etc.) present?; 2. How corrosive is the water to surface equipment: Are special alloys needed?; 3. What should be the ultimate disposition of the water: What environmental problems are presented?; 4. Does the chemical composition of the flowing water change with time?

158. GGIS-100308/O/ / /A/ // //

Title- Chemical Analysis Of Dissolved Natural Gas In Water From The World's First Geopressured-Geothermal Well

Author(s)- / Karkalits , O.C. / Hankins , B.E. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

Geopressured Geothermal Bibliography

USA (July 25 , 1978)
Publisher- Geothermal Resources Council
Davis, California
Publication date- Vol. 2 , Issue 1 , 1978
Pagination- Page 351 , 4 Pages
Available- Geothermal Resources Council
P.O. Box 98
Davis
California
95616
Local Availability- CES
Corporate Author- McNeese State Univ.
Lake Charles , Louisiana , USA
Auxiliary expression(s)-
Table
Illus. / Diagram (1) / Graph (1) /
Ref.
Descriptor(s)- / Aquifers / Chemical analysis / Chemical analysis
methods / Chemical composition / Dissolved gas / Geopressured
wells / Louisiana / Methane / Natural gas / Solubility /
Abstract by Author (rev.)
Before this project was begun, there was widespread disagreement
as to the amount of natural gas dissolved in geopressured
geothermal water. Everyone who had sampled geopressured
geothermal water could easily observe that it contained natural
gas in solution. There was, however, no assurance that the water
was saturated. Jones (1976) had confidently asserted that the
water was saturated. A major question to be answered in the
McNeese project was to find out if the waters were in fact
saturated with natural gas. Two sand bed aquifers were tested
with the following results: (1) the waters from sand-bed
aquifers No. 1 and No. 3 are substantially saturated with respect
to natural gas at the pressure and temperature existing in the
aquifers; (2) the solubility of methane in saline waters,
containing 11-14% total dissolved solids, is reduced by 35-50%
over that which it would have had in pure water at reservoir
conditions; (3) there is a possibility that the other components
of natural gas (CO (sub 2), N (sub 2), higher hydrocarbons) tend
to diminish the solubility of methane in water. The matter needs
more study than was possible within the time frame of this
project.

159. GGIS-100995/ / / /A/ / / / /

Title- Chemical Characterization of Gases and Volatile Heavy Metals in
Geothermal Effluents

Author(s)- / Robertson , David E. / Fruchter , Jonathon S. / Ludwick
, J. Donald / Wilerson , Connie L. / Crecelius , Eric A. / Evans
, John C. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 579 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98
Davis
California
95616

Local Availability- CES

Sponsor- / National Science Foundation
75-14714

Sponsor- / U.S. Department of Energy
EY-76-C-06-1830 /

Corporate Author- Batelle Pacific Northwest Labs.
Richland , Washington , USA

Auxiliary expression(s)-
Illus. / Diagram (2) /
Table

Descriptor(s)- / Ammonia / Arsenic / Boron / California / Chemical
composition / Chemical effluents / Geothermal fluids /
Geothermal power plants / Hydrogen sulfides / Idaho / Louisiana /
Mercury / Radon /

Abstract by Author (rev.)

The rapidly increasing number of successfully drilled geothermal production wells is a good indication that geothermal energy development may meet or exceed projected forecasts of its potential as a cheap, clean source of energy. However, geothermal energy is not without some environmental impact. Indeed, the very hot geothermal processes which create the steam or hot water used for energy production can also mobilize volatile and hot-water-leachable chemical constituents and bring them to the surface from great depths in the earth. Non-condensable gases such as hydrogen sulfide, ammonia, radon, carbon dioxide, methane, and other volatile elements such as mercury, boron, arsenic and selenium are vented to the air when geothermal resources are tapped. Thermal waters reaching the earth's surface contain very high concentrations of a wide variety of dissolved chemical constituents, some of which are toxic in relatively low concentrations (H (sub 2) S, NH (sub 3), Hg, As, Cu, Zn, Se, Pb, Ag, Zn, Sb and Cd. It is essential that the effluents from each specific site be characterized to define and quantify the releases of undesirable materials. This paper summarized some of the results of our chemical characterizations of geothermal effluents.

160. GGIS-100023/J/ / /A/ / / / /

Title- Chemical Composition of Deep Formation Waters in Southwestern Louisiana

Author(s)- / Dickey , P.A. / Collins , A.G. / Fajardo , I /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 56 , Issue 8 , August 1972

Pagination- Page 1530 , 4 Pages

Descriptor(s)- / Chemical composition / Geological surveys /
Geopressured systems / Ground water / Hydrology / Interstitial
water / Louisiana / Natural gas fields / Water chemistry /

161. GGIS-100407/O/ / /A/ / / / /

Title- Chemical Ecology Investigations at the Geysers, California

Author(s)- / Ireland , Robert R. / Carter , James L. /

Geopressured Geothermal Bibliography

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
Salt Lake City
Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 675 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasek W. Roberts

Available- Geothermal Resources Council

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95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Graph (4) / Map (1) /

Ref.

Descriptor(s)- / Aquatic ecosystems / California / Chemical analysis
/ Ecology / Ecosystems / Electric power generation / Environment
/ Environmental effects / Erosion / Geothermal fluids / Geysers
Geothermal Field / Natural steam / Power plants / Regional
analysis / Thermal waters / Water quality /

Abstract by GGIS

The chemical aquatic ecology program associated with the Geysers geothermal field is described in this article. The goal of this program is to determine the long term ecosystem effects that effluents discharged during the geothermal development process have on the aquatic environment. Key components of the program include measuring the soluble, particulate and sediment partitioning of various drift related and natural geochemical constituents, and determining the impact of geothermal development in this area where natural thermal tributaries and abandoned mercury mine tailings are present.

162. GGIS-100174/J/ / /A/ / / / /

Title- Chemical Problems in Geopressured Geothermal Energy Development

Author(s)- / Wilson , J.S. /

Journal- Trans. Am. Nucl. Soc.

Publication date- Vol. 28 , June 1978

Pagination- Page 5

Descriptor(s)- / Geopressured systems / Geothermal fluids / Brines /
Pressure dependence / Fluid withdrawal / Chemical reactions /
Chemical composition / Scaling / Waste disposal / Chemistry /
Artificial recharge /

Abstract by Author

Chemical problems in the production, utilization, and disposal of geopressured geothermal waters are considered. Chemical compositions of the waters are uncertain due to lack of actual production and analyses. However, probable compositions are inferred on the basis of analyses of oil field brines from the geopressured zones in Texas and Louisiana and the results of the

recent data gathered in the testing of the Delcambre well near Lafayette, Louisiana. The apparent origin of these brines is the re-solution of salts rather than the evaporation of old seas. For expected concentrations at their depths they contain lower sodium chloride, calcium, bromide, and sulfate but higher bicarbonate and chloride/potassium levels. Production effects considered include those of pressure loss in the formation as drawdown occurs, plus the drop in pressure as the brine moves up the well tubing. These effects may include solids formation within the producing sands leading to decreased permeability and scaling in the well tubing reducing flow rates. Utilization effects include scaling at points of pressure and/or temperature drop plus release of noncondensable gases of an undesirable nature and corrosivity of the waters. Reinjection effects deal with suspended solids which must be removed prior to injection and possible chemical interactions of the reinjected brines with existing formation waters to produce solids and thus reduce the permeability of the receiving sands. Current data indicate that the geopressed waters will present less severe chemical problems than those encountered in the utilization of the average convection-type geothermal system.

163. GGIS-100308/O/ / /A/ / / / /

Title- Chemistry of Waters in the Geopressed Zone from Coastal Louisiana

Subtitle- Implications for the Geothermal Development

Author(s)- / Kharaka , Yousif K. / Brown , Patrick M. / Carothers , William W. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 371 , 4 Pages

Available- Geothermal Resources Council

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Local Availability- CES

Corporate Author- Geological Survey

Menlo Park , California , USA

Auxiliary expression(s)-

Illus. / Graph (3) /

Table

Ref.

Descriptor(s)- / Chemical analysis / Chemical composition / Energy source development / Geopressed zones / Gulf Coast / Interstitial water / Louisiana / Salinity / Waste injection / Water chemistry /

Abstract by Author

Detailed chemical analyses of 27 formation-water samples from 7 oil and gas fields in the Lafayette area, Louisiana, show that

the salinity of water in the geopressured zone ranges from about 22,000 to 275,000 MG/L dissolved solids. The large differences in the salinity of water in the geopressured zone from different fields result mainly from interaction of water with salt beds. The concentrations of H₂S (<1 MG/L), silica (<114 MG/L), and a number of toxic trace metals are low in the geopressured geothermal waters. The relatively high salinity of these waters, however, and the moderately high concentration of environmentally toxic components (boron, up to 69 MG/L, and ammonia, up to 100 MG/L, for example) are unfavorable to geothermal development. The chemical data indicate that careful evaluation of the compatibility of the spent geothermal waters and the waters in the formations used for injection waters and the waters in the loss of porosity due to precipitation of carbonates and sulfates of Ca, Sr, and Ba.

164. GGIS-100024/B/ / 11/A/ // //

Title- Clays with Abnormal Interstitial Fluid Pressures

(Paper 9 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)

Author(s)- / Chapman , Richard C. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 11 , 1974

Pagination- Page 131 , 6 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Clay / Compaction / Fluid pressure / Geopressured zones / Gulf Coast / Interstitial water / Migration / Overburden / Permeability / Porosity /

Abstract by GGIS

Regions of abnormally high fluid pressures such as those in the U.S. Gulf Coast are generally caused by the compaction of clay rocks under the load of overlying sediments. Abnormal interstitial fluid pressures occur when the rate of loading exceeds the rate of fluid dispersal. Compacted clay overlying a permeable bed forms a barrier to the upward migration of fluid. Rubey and Hubbert's equation for equilibrium depth is discussed and re-expressed. Drilling has detected the presence of a transition zone between zones of normal and abnormal pressures. In this transition zone the rate of increase of fluid pressure is greater than that of the geostatic pressure, bulk density decreases and porosity increases. The transition zone represents a zone of leakage from the zone of abnormal pressure to the normally pressured zone. If the zone of abnormal pressure is a rock unit of low hydraulic conductivity overlying one of high conductivity and normal pressures, a second transition zone mirroring the one at the top of the unit will exist at the bottom. Thus, there may also be an area of petroleum potential below the abnormally pressured zone.

165. GGIS-100995/ / / /A/ // //

Title- Combined Electromagnetic and Galvanic (d.c.) Electrical Resistivity Soundings

Author(s)- / West , Richard C. / Pritchard , James A. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 713 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Electrodyne Surveys

Sparks , Nevada , USA

Auxiliary expression(s)-

Illus. / Figure (2) /

Ref.

Descriptor(s)- / Electromagnetic surveys / Exploration methods /
Geologic structures / Geothermal exploration / Magnetic surveys /
Magnetotelluric surveys / Resistivity surveys / Telluric
surveys /

Abstract by Author

The problem often encountered in the exploration for geothermal resources by any geophysical method is the complexity of the geologic setting. Because the known geothermal fields of the world are associated with crustal block movement, volcanic activity, faulting and fracturing systems, two and three dimensional geologic structures are normally encountered and have to be considered when planning an exploration program. Electrical resistivity methods have been very successful in locating areas of low resistivity associated with geothermal resources, but resolving the complexity of the geoelectric structure is difficult because of the high cost of detailed surveys or because of weaknesses inherent in some of the less expensive methods, such as galvanic or telluric current methods. A new combination of three of the basic electrical methods, galvanic, controlled source electromagnetic and telluric profiling methods, is discussed as an alternative detailing tool which can provide less ambiguous results at a reasonable cost.

166. GGIS-100532/0/ / /A/ / / / /

Title- Combining Total Energy and Energy Industrial Center Concepts to Increase Utilization Efficiency of Geothermal Energy

Author(s)- / Bayliss , B.P. /

Conference- Conference on Research for the Development of Geothermal Energy Resources

Pasadena

CA (September 23 , 1974)

Publication date- December 31 , 1974

Pagination- Page 325 , 6 Pages

Local Availability- GGIS

Descriptor(s)- / Electric power industry / Energy policy / Government policies / Industry / Planning / Recommendations /

Abstract by GGIS

A total energy concept is described in which energy production and energy consumption are integrated, producing a

Geopressured Geothermal Bibliography

total energy system within an industrial center. Government and industry cooperation and support are required.

167. GGIS-100324/R/ / /M/ / / / /

Title- Commercialization Focus Group Interview:

(Summary Report)

Subtitle- Gas from Unconventional Sources

Publication date- August 1978

Pagination- 11 Pages

Report/patent- DOE/TIC-10026

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U. S. Department of Energy

EV-78-C-01-6457 /

Corporate Author- Elrick and Lavidge, Inc.

San Francisco , California , USA

Descriptor(s)- / Geopressured systems / Natural gas deposits / Coal deposits / Commercialization / Devonian period / Government policies / Market / Meetings / Methane / Sandstond /

Abstract by TIC

A group interview conducted on the subject of gas from unconventional sources is summarized. Sources examined included geopressurized methane, tight sands, Devonian shale, and coalbed methane. The group did not feel that there were any technological barriers to the development of any of these sources. They are all viewed as commercially feasible but they are more costly than present sources of natural gas. Group participants felt that involvement by the Federal government inhibits rather than stimulates progress insofar as the development and sale of natural gas is concerned. Private industry feels that if it were allowed to operate without intervention, it could effect solutions more quickly and economically. Companies would follow a variety of different actions depending on their own expertise and the competitive market situation.

168. GGIS-100218/J/ / /A/ / / / /

Title- Compaction and Its Influence to Well Logging Profiles with Special Regard to the Study of Overpressure Areas

Author(s)- / Marko , L. / Gellert , T. /

Journal- Magy. Geofiz.

Publication date- Vol. 17 , Issue 6 , 1976

Pagination- Page 225 , 9 Pages

Language- Hungarian

Descriptor(s)- / Well logging / Petroleum exploration / Sediment compaction / Compaction / Geopressure exploration / Geopressured zones /

169. GGIS-100024/B/ / 11/A/ / / / /

Title- Compaction and Migration of Fluids in Miocene Mudstone, Nagaoka Plain, Japan

(Paper 5 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)

Author(s)- / Magara , Kinji /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 11 , 1974

Pagination- Page 62 , 36 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Japan / Petroleum / Oil and gas fields / Economic geology / Asia / Gas / Nagaoka Plain / Exploration / Reservoir rocks / Pyroclastics / Migration / Geopressure / Diagenesis / Compaction / Porosity / Permeability / Mudstone / Hydrostatic pressure / Pore water / Release / Isopach maps / Miocene /

Abstract by Author

The main hydrocarbon reservoirs in Nagaoka Plain, Japan, are volcanic and pyroclastic rocks of the Neogene Nishiyaman States (Neogene). The migration of hydrocarbons seems to have occurred from adjacent sedimentary source beds to the volcanic reservoirs, facilitated by differential compaction. Therefore, it is possible to determine the directions of the compaction currents by using horizontal porosity distributions of covered mudstone bodies. The differential compaction maps of the mudstone source beds overlying the reservoirs may indicate the directions of hydrocarbon migration, and may suggest the location of hydrocarbon accumulations in Nagaoka Plain. As fluid is expelled from pores of the mudstone, compaction occurs and porosity decreases. However, if fluid expulsion is inhibited because of low permeability, mudstone compaction may not be great and a high porosity-high fluid pressure situation will result. With such a low-permeability mudstone acting as a barrier to fluid expulsion, compaction currents could move downward in the level below the low-permeability zone and upward above that zone. The volumes of the compaction currents are estimated from the vertical porosity distributions and the porosity differences before and after compaction. The resultant figures are discussed in connection with the possible hydrocarbon accumulations. There are some abnormal pressures in the reservoirs of the Fujikawa, Kumoide, and Mitsuke gas and oil fields in the plain, whereas normal hydrostatic pressures are observed in the reservoirs of such fields as Katagai, Nishi-Nagaoka, and Higashi-Sanjo. This suggests the presence of permeability barriers in the volcanic reservoir rocks. The depths of the volcanic reservoirs and the thickness of the sealing mudstone beds are greater at Fujikawa, Kumoide, and Mitsuke, where abnormal pressures are found, than at Katagai, Nishi-Nagaoka, and Higashi-Sanjo, where reservoir pressures are hydrostatic. Therefore abnormal pressures in this district may be ascribed to the thick mudstone seals and overburden pressures.

170. GGIS-100034/J/ / 16/A/ / / / /

Title- Compaction of Argillaceous Sediments

(Festschrift to N. B. Vassidovich and K. O. Emery)

Author(s)- / Rieke , Herman H., 3. / Chilingarian , George V. /

Journal- Dev. Sedimentol.

Publication date- Issue 16 , 1974

Pagination- 424 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Sediments / Sedimentation / Engineering geology /
Clastic rocks / Terrigenous / Diagenesis / Materials /
Thermodynamic properties / Argillaceous / Density / Porosity /
Pore water / Pressure buildup / Depth / Basins / Subsidence /
Geopressure / Compaction / Fluid mechanics / Models / Chemical
composition / Petroleum / Water / Shale / Brines / Ground water /
Rheology / Elastic properties / Strength / Textbooks /

171. GGIS-100528/O/ / /A/ / / / /

Title- Compaction Measurements on the Sweet Lake Test Well

Author(s)- / Jogi , P.N. / Kalra , S. / Gray , K.E. / Thompson ,
T.W. /

Conference- Fifth Conference on Geopressured-Geothermal Energy ()
October 13 , 1981)

Publication date- 1981

Pagination- Page 311 , 5 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-79ET27112

Sponsor- / Gas Research Inst., Chicago, IL (USA)

DE-AC08-79ET27112 /

Auxiliary expression(s)-

Illus. / Graph (7) /

Table

Ref.

Descriptor(s)- / Cameron Parish / Compaction / Compressibility /
Drill cores / Louisiana / Measurement / Permeability / Porosity /
Sampling / Testing /

Abstract by Author

Measurements of compressibilities, moduli, compaction coefficients, porosities, and permeabilities have been conducted on cores from Magma Gulf-Technadril/ Department of Energy Amoco Fee No. 1 in the Sweet Lake Field in Cameron Parish, Louisiana. All rock parameters show nonlinear behavior with changing reservoir pressure. Compressibilities and uniaxial compaction coefficients decline rapidly with pore pressure reduction. Porosity reduction was generally less than 10 percent; permeability reduction was 30-40 percent. Additional tests are in progress.

172. GGIS-100528/O/ / /A/ / / / /

Title- **Compaction Measurements on Cores from the Pleasant Bayou Wells**

Author(s)- / Jogi , P.N. / Gray , K.E. / Ashman , T.R. / Thompson , T.W. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 75 , 7 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (8) /

Table

Ref.

Descriptor(s)- / Compaction / Compressibility / Gulf Coast / Measurement / Permeability / Pleasant Bayou No. 1 Well / Pleasant Bayou No. 2 Well / Porosity / Resistivity surveys / Rock properties / Texas /

Abstract by Author

Additional measurements of compressibility, compaction coefficients, porosities, permeabilities, and resistivities have been conducted on cores from Pleasant Bayou Wells #1 and #2. All rock parameters show non-linear behavior with changing reservoir or pore pressure, which is of interest in modelling reservoir performance and subsidence. Compressibilities and uniaxial compaction coefficients decline by a factor of 2 to 3 as reservoir pressure declines from geopressured to normal hydrostatic conditions. Porosity reductions are 6 - 8 percent while permeability reductions are on the order of 10 - 30 percent over that reservoir pressure range. Measured formation factors were 2 - 4 times log derived values for F. Matrix compressibilities were not insignificant relative to bulk compressibilities.

173. GGIS-100030/J/ / 602/A/ / / / /

Title- **Compaction, Diagenesis, and Migration in Argillaceous Sediments**

(Vertical Stress, Fluid Pressure, Grain-to-Grain Pressure, Clay Mineralogy, Geopressure, Oil and Gas)

Original Title- Compactions Diagenese, et Migration Dans les Sediments Argileux

Author(s)- / Rumeau , Jean-Louis / Sourisse , Claude /

Journal- Cent. Rech. Pau, Bull.

Publication date- Vol. 6 , Issue 2 , 1972

Pagination- Page 313 , 33 Pages

Language- French

Auxiliary expression(s)-

Sum.

Illus.

Descriptor(s)- / Sediments / Clay mineralogy / Sedimentation / Petroleum / Natural gas / Clastic rocks / Terrigenous /

Geopressured Geothermal Bibliography

Experimental studies / Diagenesis / Origin / Argillaceous /
Composition / Geopressure / Fluid pressure / Relation /
Compaction / Migration / Shale /

174. GGIS-100308/0/ / /A/ / / / /

**Title- Comparison of Direct Contact Binary Power Plants for
Geothermal Application Using Multiple Cycles**

Author(s)- / Jacobs , Harold R. / Cook , D. Scott / Boehm , Robert F.
/

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council
Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 321 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

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Local Availability- CES

Corporate Author- Utah Univ.

Salt Lake City , Utah , USA

Auxiliary expression(s)-

Table

Illus. / Diagram (3) /

Ref.

Descriptor(s)- / Binary cycle power generation / Elevated temperature
/ Geothermal brines / Hexane / Pentane / Salinity / Thermodynamic
cycles / Working fluids /

Abstract by Author

Direct contact systems with bottoming cycles for moderate
temperature brines are shown to increase significantly the net
power that may be produced per unit flow rate of brine. For
143.3 DEG C brine a pentane-hexane system yields the highest
brine utilization.

175. GGIS-100899/0/ / /A/ / / / /

Title- Comparison of Geothermal Power Conversion Cycles

Author(s)- / Elliott , David G. /

Conference- 11 Intersociety Energy Conversion Engineering Conference

Pagination- Page 771 , 7 Pages

Report/patent- SAE--769136

Sponsor- / U.S. Energy Research and Development Administration

AT(04-3)-1086 /

Corporate Author- Jet Propulsion Lab.

Pasadena , California , USA

Auxiliary expression(s)-

Illus. / Diagram (7) / Graph (3) /

Table

Ref: 1
 Descriptor(s)- / Binary fluid systems / Energy yield / Flash steam systems / Geothermal energy conversion / Performance / Thermal efficiency / Turbines /

Abstract by Author
 Geothermal power conversion cycles are compared with respect to recovery of the available wellhead power. The cycles compared are flash steam, in which steam turbines are driven by steam separated from one or more flash stages; binary, in which heat is transferred from the brine to an organic turbine cycle; flash binary, in which heat is transferred from flashed steam to an organic turbine cycle; and dual steam, in which two-phase expanders are driven by the flashing steam-brine mixture and steam turbines by the separated steam. Expander efficiencies assumed are 0.7 for steam turbines, 0.8 for organic turbines, and 0.6 for two-phase expanders. The fraction of available wellhead power delivered by each cycle is found to be about the same at all brine temperatures: 0.65 with one stage and 0.7 with four stages for dual steam; 0.4 with one stage and 0.6 with four stages for flash steam; 0.5 for binary; and 0.3 with one stage and 0.5 with four stages for flash binary.

176. GGIS-100368/ / / /M/ / / / /

Title- Comparison of Prospect Areas on the Basis of Potential Environmental Impacts

Subtitle- 1st Volume

Author(s)- / Newchurch, E. J. / Bachman, A. L. / Bryan, C. F. / Harrison, D. P. / Muller, R. A. / Newman, J. P., Jr. / Smith, C. G., Jr. / Bailey, J. I., Jr. / Kelly, G. G. / Reibert, K. C. /

Publication date- October 15, 1978

Pagination- 150 Pages

Report/patent- ORO-5862-7(vol. 1)

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Department of Energy

ET-78-S-05-5762/

Corporate Author- Louisiana State Univ. Baton Rouge

Institute for Environmental Studies

Baton Rouge, Louisiana, USA

Auxiliary expression(s)-

Table

Figure (8)

Ref:

Descriptor(s)- / Air quality / Ecology / Environmental effects /

Geology / Geopressured zones / Gulf Coast / Hydrogeology / Land

use / Louisiana / Testing / Water quality /

Abstract by Author

This two-volume report presents the results of a preliminary environmental assessment of the following geopressured-geothermal prospect areas in the Louisiana Gulf coast region: South Johnson's Bayou, Sweet Lake, Rockefeller Refuge, Southeast Pecan Island, Atchafalaya Bayou, and Lafourche

Crossing. In Volume I, these prospect areas have been compared to determine their relative environmental acceptability for the test program. Trade-offs among the prospects in terms of potential impacts are highlighted. This assessment was made on the basis of the nature and extent of the proposed testing activities in view of the environmental characteristics of each prospect area: land use, geology and geohydrology, air quality, water resources and quality, ecological systems, and natural hazards. Volume II includes a compilation of environmental baseline data for each prospect area derived from existing sources. The comparison of prospect areas presented in this report includes consideration of worst case situations. However, we believe that the test program activities, because they are so small in scale, will not result in major adverse impacts. No prospect area, with the possible exception of Rockefeller Refuge, needs to be excluded from consideration for the test well program.

177. GGIS-100267/B/ / /A/ / / / /

Title- Comparison of Scientific and Legal Definitions of Geothermal Energy Resources

Author(s)- / Elmer, D.B. /

Publisher- Geothermal World Publications

Reseda, California

Publication date- 1977

Pagination- Page 360, 9 Pages

Auxiliary expression(s)-
Ref.

Descriptor(s)- / Geopressure resources / Geothermal resources /
Geothermal systems / Laws / Legal aspects /

Abstract by TIC

Differences in scope and perspective of definitions of geothermal energy resources as adopted by the scientific and legal professions are discussed. Variations in statutory approaches taken by the Federal government and several states are discussed. The importance of placing geopressured-geothermal systems is emphasized. A detailed legal definition is suggested. A recommended condensed version that preserves the structural validity from scientific characterization states: "geothermal energy resources" are and include: (i) any and all geologic formations, systems, or configurations; (ii) which possess large amounts of heat energy at temperatures significantly higher than ordinary thermal gradient in surrounding geologic strata; (iii) and are so situated that the energy of the system is available to do work or provide heat; (iv) and which may involve complex thermal conduction/convection systems which contain natural or artificially introduced heat transfer mediums; (v) and which mediums may contain as by-products, associated gases and solute minerals; (vi) and which express energy as heat and/or pressure. (JGB)

 178. GGIS-100055/J/ / 1245/A/ / / / /

Title- Comparison of 50 Millibar Geopotentials Derived from Satellite Infrared Spectrometer Readings with those Derived from a Series of Analyzed Charts

Author(s)- / Watson , N. R. / Bailey , V. /

Journal- Meteorol. Mag.

Publication date- Vol. 105 , Issue 1245 , 1976

Pagination- Page 105 , 5 Pages

179. GGIS-100259/R/ / /M/ / / / /

Title- Compilation of Data on Fluids from Goethermal Resources in the United States

Publication date- May 1978

Pagination- 112 Pages

Report/patent- LBL-5936

Corporate Author- California University, Berkeley

Lawrence Berkeley Laboratories

Berkeley , California , USA

Descriptor(s)- / Data / Geothermal fluids / Geothermal wells / USA / Water chemistry /

Abstract by TIC

Available data on the chemistry of geothermal fluids from important geothermal resources in the U. S. are presented. Candidates for inclusion in the compilation were fluids from wells, but not hot springs, with a heat capacity exceeding 1×10^{18} CAL and temperatures greater than 90 DEG C. The data is stored in the computer data base as records. (JGB)

180. GGIS-100393/O/ / /A/ / / / /

Title- Completion and Testing of No. 2 Pleasant Bayou Well

Author(s)- / Stevens , John E. / Clark , J. Don /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 1 , June 1980

Pagination- Page 200 , 17 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

78712

(Paper copy)

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (3) / Map (1) /

Table

Descriptor(s)- / Chemical composition / Dissolved gases / Dissolved solids / Pleasant Bayou No. 2 Well / Production testing / Well completion / Well head pressure / Well testing / Methane / Geopressured wells /

Geopressured Geothermal Bibliography

Abstract by Author

Beginning with preparation on July 8, 1979, (between 14,704 and 14,684 ft) the well was subjected to a 24-hour production test which is described in detail and interpreted via the wellhead pressure variations. Initial brine chemical analysis indicated a dissolved gas content of 21 ft³/bbl. Primary constituents of the gas were methane (84%), ethane (3%), and carbon dioxide (10%). The brine contained dissolved solids at a total concentration of 156,000 MG/L. This paper also describes the planned one-year test program which will include an initial phase limited to 20,000 BBL/day flow followed by installation of more extensive surface equipment which will allow the maximum flow rate to be increased to 40,000 BBL/day. It is anticipated that 4,7000,000 BBL of brine will be withdrawn during the dynamic portion of these tests.

181. GGIS-100577/R/ / /M/ / / / /

Title- Completion Techniques for Geothermal-Geopressured Wells

Author(s)- / Boyd, W.E. /

Pagination- 162 Pages

Note- Final report: special projects research for petroleum engineering aspects of geothermal research

Local Availability- CES

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Geopressure / Louisiana / Reservoir engineering / Texas / Well completion /

182. GGIS-100329/R/ / /M/ / / / /

Title- Completion Techniques for Geothermal-Geopressured Wells

Subtitle- Final Report

Author(s)- / Boyd, W.E. /

Publication date- 1977

Pagination- 162 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

Texas

78712

(Paper Copy)

Local Availability- CES

Sponsor- / U.S. Energy Research and Development Administration

E-(40-1)-5243 /

Corporate Author- Texas Univ., Austin

Center for Energy Studies

Austin, Texas, USA

Auxiliary expression(s)-

Illus. / Diagram (44) / Graph (4) / Photo (7) /

Table

Ref.

Descriptor(s)- / Flow rate / Geopressured wells / Gravel packing / Gulf Coast / Pipes / Sand control / Well casings / Well completion /

Abstract by Author

Geological studies have established that goethermal geopressured formations can be found at depths of 10,000 to 18,000 feet in the Gulf Coast area of Texas and Louisiana. Bottom hole pressures are in the range of 9,000 to 15,000 psig and temperatures 150-350 DEG F. Test wells to tap these reservoirs can be drilled routinely, utilizing available equipment and methods. Electric logs, surveys, cores and production tests can be used to assess these resources and to evaluate their economic viability as primary sources of energy. But it will be necessary to complete the wells in such a fashion that production of the high-pressured fluid can be obtained to deliver heat, mechanical energy and methane gas in economic quantities. This will require carefully considered completion techniques, involving pipe sizes and accessory equipment suitable for high volumes of stimulation treatments and/or sand control measures to obtain optimum rates flow with minimum sand influx. It appears that gravel-packed completions will be more feasible at this time than chemical consolidation treatments to control sand production because of high flow rates. Flow rates up to 100 barrels per day per foot of perforations should be possible from consolidated formations without sand control treatments.

183. GGIS-100058/J/ / 7347/A/ // //

Title- Complex Sediments Hard to Interpret

(North Sea)

Subtitle- 2. of 2 pt., Interpreting Pressure Profiles

Author(s)- / Gill , J. A. / Gregg , D. N. /

Journal- Oil and Gas Journal

Publication date- Vol. 73 , Issue 47 , November 24 , 1975

Pagination- Page 63 , 4 Pages

Corporate Author- NL Industries, Inc.

Houston , Texas , USA

Descriptor(s)- / Boreholes / Control / Diagenesis / Drilling fluids / Exploration / Geopressured systems / Natural gas deposits / North Sea / Petroleum deposits / Pressure dependence / Pressure measurement / Rock drilling / Sea bed / Sediments / Shale / Solids / Stratigraphy / Water / Well drilling / Well logging /

Abstract by GGIS

The conditions under which positive hole stabilization (and reduced drilling costs) can be reached are discussed in this article. By using an appropriate combination of mud chemistry and pressure balance, and with the exercise of prudent drilling practices, this objective can be obtained. The major concern of this article is to show why the sediments of the North Sea require site specific interpretation, and why a single trend line from a log plot assuming a thick, uniform shale sediment is inappropriate for sediment analysis. If the erratic compaction trends in the North Sea can be established, the sediments would then conform to conventional pressure calibration curves.

184. GGIS-100476/R/ / /M/ / / / /

Title- Computer Simulation of Production from
Geopressured-Geothermal Aquifers

(October 1, 1978 - September 30, 1979)

Subtitle- Project 61025 Annual Report

Author(s)- / Rogers , L.A. /

Publication date- June 1980

Pagination- 102 Pages

Report/patent- DOE/ET/27098-1

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-78ET27098 /

Corporate Author- Institute of Gas Technology

Chicago , IL , USA

Descriptor(s)- / Aquifers / Computerized simulation / Data
compilation / Dissolved gases / Edna Delcambre No. 1 Well /
Exploratory wells / Gas caps / Gas production / Geopressured
reservoirs / Geothermal brines / Graphs / Mathematical models /
Natural gas / Natural gas wells / Reservoir engineering /
Reservoir properties /

Abstract by ERA

In the Department of Energy test of the Edna Delcambre No. 1 well for recovery of natural gas from geopressured geothermal brine, part of the test produced gas in excess of the amount that could be dissolved in the brine. Where this excess gas originated was unknown and several theories were proposed to explain the source. This annual report describes IGT's work to match the observed gas/water production with computer simulation. Two different theoretical models were calculated in detail using available reservoir simulators. One model considered the excess gas to be dispersed as small bubbles in pores. The other model considered the excess gas as a nearby free gas cap above the aquifer. Reservoir engineering analysis of the flow test data was used to determine the basic reservoir characteristics. The computer studies revealed that the dispersed gas model gave characteristically the wrong shape for plots of gas/water ratio, and no reasonable match of the calculated values could be made to the experimental results. The free gas cap model gave characteristically better shapes to the gas/water ratio plots if the initial edge of the free gas was only about 400 feet from the well. Because there were two other wells at approximately this distance (Delcambre No. 4 and No. 4A wells) which had a history of down-hole blowouts and mechanical problems, it appears that the source of the excess free gas is from a separate horizon which connected to the Delcambre No. 1 sand via these nearby wells. This conclusion is corroborated by the changes in gas composition when the excess gas occurs and the geological studies which indicate the nearest free gas cap to be several thousand feet away. The occurrence of this excess free gas can thus be explained by known reservoir characteristics, and no new model for gas entrapment or production is needed.

185. GGIS-100043/J/ / /A/ / / / /

Title- Computer Storage, Processing and Display of Geothermal Data

Author(s)- / Palmer , R.A. /

Publication date- Vol. 6 , Issue 1 , 1977

Pagination- Page 31 , 7 Pages

Descriptor(s)- / Chemical analysis / Computer codes / Data / Data
processing / Geothermal fluids / Liquid wastes / Steam / Waste
water /

Abstract by TIC

A computer program is described for storing and processing the chemical analyses of steam and water discharges for geothermal fields. Examples of the commands used to control the program are given and some sample output is presented.

186. GGIS-100177/R/ / /M/ / / / /

Title- Computer Techniques to Aid in the Interpretation of Subsurface Fluid-Pressure Gradients

Subtitle- Computer Contribution

Author(s)- / Wesselman , J. B. / Heath , J. /

Publication date- June 1977

Pagination- Page 36

Report/patent- PB--268603

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / USGS

USGS/WRD/WRI--77/035 /

Corporate Author- Geological Survey

Water Resources Div.

Bay St. Louis , Mississippi , USA

Descriptor(s)- / Computer calculations / Data analysis / Evaluation /
Geopressured systems / Louisiana / Pressure gradients / Texas /
Well logging /

Abstract by DOE/RECON

Fluid-pressure gradients have been investigated in two geopressured-geothermal areas in Texas and Louisiana. Data were obtained from drilling records, resistivity curves of geophysical logs, and pressure tests made in bore holes. These data were converted to gradients and graphed by computer techniques. Resistivity interpretation gave reasonable results at some point in about 70 percent of the wells. Evaluation of all available data shown in the individual and adjacent wells was found to be necessary for proper gradient interpretation.

187. GGIS-100393/O/ / /A/ / / / /

Title- Computerized Log Analysis: A "Non-Black Box" Approach

Author(s)- / Potter , Jeff / Rusk , Mark / Schneider , Robert / Hill ,
Tom /

Geopressured Geothermal Bibliography

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3, June 1980

Pagination- Page 1263, 8 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

DE-AC08-79ET-27018 /

Corporate Author- Texas Univ.

Center for Energy Studies

Austin, USA

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Computers / Data processing / Geopressured
reservoirs / Information systems / Resistivity logging /
Salinity / Sand / Shale / SP logging / Well logging / Zonation /

Abstract by Author

A Geopressured Geothermal Information System (GGIS) is being developed as a part of the Geothermal Energy Research Program of the Center for Energy Studies (CES), The University of Texas at Austin. GGIS has developed a system of log analysis routines which will develop and plot sand and salinity profiles. Input data is the digitized SP log and header data. Additional routines provide SP correction utilizing the digitized resistivity log. The system, dubbed ANALYSE, enables the user of a Tektronix terminal to inspect the log, sand profile, and shale base-line data being used by ANALYSE. As many data windows may be inspected as desired. The routine then gives the user the option of requesting a new sand profile run using new zoning parameters. In effect, the analyst is able to "draw" the shale base-line and sand profiles to his own standards using the computer as a high-speed tool.

188. GGIS-100118/ / / /M/ / / / /

Title- Conceptual Design of Total Flow Prime Movers for Geopressure
Resource Utilization

(7/74 to 6/75)

Author(s)- / Underhill, G. K. /

Publication date- 1975

Available- University of Texas, School of Engineering

Univ. of Texas

School of Engineering, Mechanical Engineering

200 W. 21st

Austin, Texas 78712

Corporate Author- Texas Univ.

Abstract by Energyline

The efficiency of geopressure geothermal electricity generation may be significantly enhanced by using so-called "total flow" prime movers--impluse turbines or reaction turbines. Not only would a higher efficiency for thermal energy

conversion be attained, but the geohydraulic energy could be converted as well. There are several problems associated with use of total flow prime movers; two problems --separation of entrained particulates upstream of the turbine and tapping-off of methane as it comes out of solution--are addressed in this project. Flows in conceptual designs of particulate separators and a total flow prime mover are investigated numerically to evaluate design efficiency for particulate separation and methane extraction, respectively.

189. GGIS-100393/O/ / /A/ / / / /

Title- Conceptual Design Studies of Energy Conversion Plants Using Geopressured Fluid

Author(s)- / Lamb , J. Parker / Polansky , Gary F. / Bradley , Stephen P. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 2 , June 1980

Pagination- Page 875 , 29 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS

Austin

TX

78712

(Paper copy)

Local Availability- CES

Corporate Author- Texas Univ.

Dept. of Mechanical Engineering

Austin , USA

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (11) /

Ref.

Descriptor(s)- / Binary cycle power generation / Design / Economics / Flashed steam systems / Flow rate / Geopressure power plants / Geopressured reservoirs / Geothermal energy conversion / Geothermal fluids / Planning / Propane / Rankine cycle / Scaling / Simulation / Systems analysis / Texas / 2-methylpropane /

Abstract by Author

This paper reviews development of system simulation models and selected results that predict performance of future power plants in Texas. Predictions are categorized as follows: (1) wellbore results which demonstrate relative unimportance of heat loss to the geological formation and importance of potential scale growth to power generation; (2) wellbore-reservoir simulations which illustrate effects of depletions rate and hence how uncertainties in initial pressure, temperature, and total aquifer volume can affect wellhead fluid conditions; (3) conversion plant performance estimates which include (a) influence of hydraulic recovery, (b) choice of thermal recovery system (flash or binary), (c) choice of binary working fluid (propane or isobutane), (d) potential performance gains from variable condensing conditions, and (e) extreme importance of maximizing gas recovery. Discussion emphasizes both design and economic compromises.

Geopressured Geothermal Bibliography

190. GGIS-100426/R/ / /M/ / / / /

Title- Condensation of Refrigerants on Vertical Fluted Tubes

Author(s)- / Combs , S. K. / Mailen , G. S. / Murphy , R. W. /

Publication date- August 1978

Pagination- 204 Pages

Report/patent- ORNL/TM-5848

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-26 /

Corporate Author- Oak Ridge National Lab.

TN , USA

Auxiliary expression(s)-

Illus. / Diagram (3) / Photo (10) / Graph (22) /

Table

Ref.

Descriptor(s)- / Binary fluid systems / Condensates / Condensers /
Cooling / Geothermal power plants / Geothermal refrigeration /
Halocarbons / Heat flow / Heat transfer / Hydrocarbons / Thermal
conductivity / Working fluids /

Abstract by Author

Experiments were run to determine heat transfer performance of single vertical fluted tubes with selected fluids condensing on the outside. Working fluids included six fluorocarbons (Refrigerants 11, 21, 22, 113, 114, and 115) and a hydrocarbon (Refrigerant 600a or isobutane). The nine test tubes were of 2.54-cm (1-in.) nominal outside diameter and 1.2-m (4-ft) in length with from 0 (smooth) to 60 axial flutes. Condensing heat transfer coefficients ranged from 620 to 7900 W/m**2 * K (110 to 1400 Btu/hr * ft**2 * deg F) over the heat flux range of 2000 to 43,000 W/m**2 (920-13,600 Btu/hr * ft**2). All parameters are based on total condensing surface area. The data show that, for a given heat flux, a fluted tube can increase condensing coefficients up to 6.0 times smooth tube values. Further heat transfer enhancement was achieved by the use of drainage skirts on fluted tubes; these skirts effectively divided the 1.2-m (4-ft) tubes into two, four, and eight equal condensing lengths.

191. GGIS-100091/ / / /M/ / / / /

Title- Conference on Geopressure Geothermal Energy

(2/75 to 6/75)

Subtitle- Research and Development

Author(s)- / Dorfman , M. H. /

Note- Estimated Calendar Year Funding Reported as 1975 \$17,000

Available- University of Texas, School of Engineering

University of Texas

School of Engineering, Petroleum Engineering

200 W. 21ST

Austin, Texas 78712

Corporate Author- U.S. National Science Foundation

Abstract by Energyline

This conference is to be held at the Joe C. Thompson Conference Center at the University of Texas at Austin for the purpose of acquainting governmental agencies, University and industrial research groups and potential user groups with a summary of the preliminary research into the geopressured geothermal resources. The conference will be divided into component parts of the resource assessment; advanced research and technology; legal; institutional, and environmental; and resource utilization. Speakers from governmental agencies, energy companies, industrial companies and universities involved in research will participate in this three day program. It is anticipated that rapid and widespread dissemination of research and technology will promote additional interest in the utilization of geopressured geothermal fluids.

192. GGIS-100421/R/ / /M/ / / / /

Title- Considerations in the Use of Water Jets to Enlarge Deep Submerged Cavities

Author(s)- / Summers , D.A. / Sebastian , Z. /

Publication date- 1980

Pagination- 12 Pages

Report/patent- SAND-80-7031C

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC04-76DP00789 /

Corporate Author- Missouri Univ.

Rolla , USA

Auxiliary expression(s)-

Illus. / Photo (5) /

Table

Ref.

Descriptor(s)- / Cost / Deep drilling / Disposal wells / Feasibility studies / Flow rate / Geopressured systems / Injection wells / Jets / Polymers / Reaming / Waste disposal /

Abstract by TIC

In order to facilitate use of reinjection wells, and to lower their cost, it has been proposed that a single well be reamed from 22-1/2 cm to 2 m diameter over an increment of 70 m at a depth of 2000 m. In this manner a single well would be capable of coping with flow rates which currently necessitate a dozen wells being emplaced. The problems encountered in using high pressure water jets for this reaming operation are described. Limiting parameters on the use of high pressure water jets and their operating diameters are identified. The considerable advantages to the use of long chain polymers in such a hostile environment are also delineated.

193. GGIS-100002/0/ / 1/A/ / / / /

Geopressured Geothermal Bibliography

Title- Consolidation and Early Diagenesis of Clays

Author(s)- / Coleman , J. M. / Ho , C. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 1 , Issue 1 , 1967

Pagination- Page 23 , 28 Pages

Descriptor(s)- / Sediments / Clastic rocks / Terrigenous / Clay /
Diagenesis / Consolidation / Sedimentation /

194. GGIS-100240/J/ / /A/ / / / /

Title- Constraints on Geothermal Development

Subtitle- Tax and Beyond

Author(s)- / McNamara , Jack /

Journal- Land Water Law Review

Publication date- Vol. 13 , Issue 1 , 1977

Pagination- Page 203 , 14 Pages

Descriptor(s)- / Constraints / Energy source development / Geothermal
resources / Government policies / Land use / Legal aspects /
Taxes / Energy policy /

Abstract by EIC

Much of the delay on development of the nation's vast geothermal resource base has been due to legal roadblocks. Developers have been denied provisions available to other fuel exploiters, namely the option to currently expense most costs and a noncost-related deduction from production income. In the absence of more favorable tax treatments, there is a dramatic downward impact on a geothermal project's internal rate of return. Possible forms of incentives are discussed. Other constraints are assessed under the heading land use; no policy decision-making process in the U. S. assimilates the diverse and conflicting values of environmentalists, consumers, energy producers, regions, and governmental agencies.

195. GGIS-100241/O/ / /A/ / / / /

Title- Constraints on Geothermal Development

Subtitle- Tax and Beyond

Author(s)- / McNamara , J. J. /

Conference- Geothermal Resources Development Institute Conference

Salt Lake City

Utah

USA (January 27 , 1977)

Publisher- Rocky Mountain Mineral Law Foundation

Boulder, CO

Publication date- January 27 , 1977

Pagination- 18 Pages

Report/patent- CONF-770135--

Descriptor(s)- / Constraints / Energy source development / Energy
policy / Geothermal resources / Government policies / Land use /
Legal aspects / Taxes /

Abstract by TIC

Difficulties with tax policies, energy policy, and various constraints as they relate to energy, especially geothermal energy, are reviewed. (MHR)

196. GGIS-100528/0/ / /A/ / / / /

Title- Continuity and Productivity Analysis of Three Geopressed Geothermal Aquifer-Natural Gas Fields

Author(s)- / Rogers , Leo A. / Boardman , Charles R. /

Conference- Fifth Conference on Geopressed-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 259 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

SC-PB-80374 /

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Analysis / Aquifers / Evaluation / Geopressed zones / Louisiana / Reservoir properties / Sand / Well drilling /

Abstract by Author

The available well logs, production records and geological structure maps were analyzed for the Hollywood, Duson, and Church Point, Louisiana Oil and Gas fields to determine the areal extent of the sealed geopressed blocks and to identify which aquifer sands within the blocks are connected to commercial production of hydrocarbons. Studies such as these are needed for the Department of Energy program to identify geopressed brine reservoirs that are not connected to commercial productions. The analysis showed that over the depth intervals at the geopressed zones shown on the logs essentially all of the sands of any substantial thickness had gas production from them somewhere or other in the fault block. It is therefore expected that the sands which are fully brine saturated in many of the wells are the water drive portion of the producing gas/oil somewhere else within the fault block. In this study only one deep sand was identified, in the Hollywood field, which was apparently not connected to a producing horizon somewhere else in the field. Estimates of the reservoir parameters were made for this sand and a hypothetical production calculation showed the probable production to be less than 10,000 b/d. The required gas price to profitably produce this gas is well above the current market price.

197. GGIS-100995/ / / /A/ / / / /

Title- Continuous Chain Drill Bit Developments

Author(s)- / Newsom , M.M / St. Clair , J.A. / Stoller , H.M. / Varnado , S.G. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 495 , 3 Pages

Available- Geothermal Resources Council

Geopressured Geothermal Bibliography

P.O. Box 98
Davis
California
95616

Local Availability- CES

Sponsor- / U.S. Department of Energy

AT(29-1)-789 /

Corporate Author- Sandia Labs.

Albuquerque , New Mexico , USA

Auxiliary expression(s)-

Illus. / Photo. (7) / Graph (3) /

Descriptor(s)- / Drill bits / Geothermal drilling /

Abstract by Author

Under DOE's Geothermal Well Technology Program, the continuous chain drill bit, in which fresh cutting surfaces are cycled into place without removing the bit from the hole, is under development by Sandia Laboratories. Fixed head bit testing has optimized cutting surface diamond patterns, developed adequate bit hydraulics, and solved the apex problem through application of Stratapax**R cutters in the bit nose. Prototype chain drill testing has demonstrated structural integrity, identified some hydraulic erosion and cycling mechanism problems, and confirmed superior drilling rate and lifetime performance to commercial diamond bits when drilling hard abrasive rock.

198. GGIS-100308/O/ / /A/ / / / /

Title- Cooling Water Requirements for Geothermal Power Plants and Water Availability in the Imperial Valley

Author(s)- / Goldsmith , Martin /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 215 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Table

Illus. / Graph (1) /

Ref.

Descriptor(s)- / California / Cooling / Electric power / Geothermal power plant / Geothermal reservoirs / Heat transfer / Power generation / Reservoir properties / Water /

Abstract by Author

The purpose of this paper is to calculate the cooling water reservoir temperature and power plants as a function of reservoir temperature and power plant type, and to examine the availability of cooling water in the Imperial Valley of

California. All power plants that convert heat to mechanical or electrical energy require a means of cooling. This is usually accomplished in one of three ways: direct transfer of heat to a body of water; direct transfer of heat to the atmosphere; evaporation of water into the atmosphere. Because geothermal resources are at a low temperature as compared to those found in ordinary steam boilers, the thermodynamic efficiency of geothermal power plants is low, and their cooling requirements are much greater as compared to conventional plants.

199. GGIS-100532/O/ / /A/ / / / /

Title- Cooperative Efforts by Industry and Government to Develop Geothermal Resources

Author(s)- / Butler , David R. /

Conference- Conference on Research for the Development of Geothermal Energy Resources
Pasadena

CA (September 23 , 1974)

Publication date- December 31 , 1974

Pagination- Page 532 , 4 Pages

Local Availability- GGIS

Descriptor(s)- / Geothermal exploration / Government policies / Industry / Planning / Recommendations /

Abstract by GGIS

Concern is expressed in this paper for the lack of coordination and communication between the private and public sectors in geothermal resource development. Areas requiring communication are those involving: resource exploration and assessment; resource utilization; advance research and technology; and legal, environmental and institutional research.

200. GGIS-100566/R/ / /M/ / / / /

Title- Corrosion Studies

(Final Report, 1 March 1980 - 27 February 1981)

Subtitle- Geopressured Aquifer Gas Production

Author(s)- / Rogers , Alfred N. / Weekes , Malcolm C. / Schoepflin , Fred /

Publication date- February 1981

Pagination- 95 Pages

Report/patent- PB82-220534

Available- NTIS

Sponsor- / Gas Research Inst., Chicago, IL (USA)
GRI-5014-321-0288 /

Corporate Author- Bechtel, Inc.
San Francisco , CA , USA

Descriptor(s)- / Brines / Corrosion / Corrosion resistance / Gas production / Production / Testing /

Abstract by NTIS

Corrosion test results on a number of metals, exposed to geothermal brines, were incorporated into matrix format to permit a ready comparison of corrosion resistance. The most promising materials were selected for further testing in flowing

Geopressured Geothermal Bibliography

geopressured brine. The selection was directed toward the use of the materials in a geopressured gas separation system supplied with a brine having a postulated composition based on analyses of four existing geopressured well and several thousand formation waters. A test plan was developed to determine the corrosion resistance of candidate materials in flowing geopressured brine. A rapid screening by the linear polarization technique is to be followed by a more extended exposure in a test loop. The use of clad or coated carbon steel for the major gas plant components was analyzed. As an alternative, the injection of a small dosage of corrosion inhibitors into the brine was investigated.

201. GGIS-100528/O/ / /A/ / / / /

Title- Corrosion Studies

Subtitle- Geopressured Aquifer Gas Production

Author(s)- / Rogers , A.N. / Weekes , M.C. / Schoepflin , Fred / Sharer , J.C. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 335 , 6 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Figure (3) /

Table

Ref.

Descriptor(s)- / Corrosion / Corrosion protection / Corrosion resistance / Economics / Experimental results / Geopressure resources / Natural gas /

Abstract by GGIS

Part of the concern for realizing an economically competitive method for recovering unconventional gas includes finding low cost materials that can be used in plant construction. The major thrust of this study was to determine whether low cost carbon steel with or without coatings or cladding is suitable as a material used in plant construction.

202. GGIS-100995/ / / /A/ / / / /

Title- Corrosion Testing in a Multiple-Stage Flash System.

Author(s)- / McCright , R.D. / Garrison , R.E. / Locke , F.E. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 415 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

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Local Availability- CES

Sponsor- / U.S. Department of Energy

W-7405-ENG-48 /

Corporate Author- California Univ., Livermore

Lawrence Livermore Lab.
 Livermore , California , USA
 Auxiliary expression(s)-
 Illus. / Diagram (1) /
 Table
 Ref.
 Descriptor(s)- / Carbon steels / Corrosion / Flashed steam systems /
 Geothermal brines / Geothermal power plants / Materials testing
 /
 Abstract by Author
 Corrosion rate results from a 720-hour exposure period to
 geothermal brine acidified to pH4 are discussed in this paper.
 The corrosion tests were performed in a four-stage flash system
 so that results obtained at different temperatures could be
 compared. Carbon steel and alternate construction materials
 were used as test specimens. Results indicate that carbon steel
 corrodes excessively (more than 50 mils/year) at temperatures
 above 150 DEG C. Alternate construction materials (alloy
 steels) may be utilized under these conditions.

 203. GGIS-100407/O/ / /A/ / / / /

Title- Cost Uncertainty and Simple Modeling for Direct Use Geothermal Resources

Author(s)- / Schoderbek , Stephen E. / Anderson , Dennis J. /
 Miewald , Jean M. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal
 Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
 Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 743

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

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Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Graph (3) /

Ref.

Descriptor(s)- / Computerized simulation / Cost / Development /
 Direct energy utilization / Economics / Equations / Exploitation
 / Feasibility studies / Geothermal energy / Geothermal
 reservoirs / Geothermal resources / Income / Industrial plants /
 Planning / Statistical models / Technology assessment /

Abstract by GGIS

Computerized simulation of geothermal reservoir
 characteristics offers the possibility of reducing the risk
 associated with the exploration, development and utilization of
 a geothermal resource. The simulation model GEOCITY was used to

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arrive at costs of energy estimates. The interaction of the cost factors was studied by means of regression analysis. This procedure provides a method for the economic planner to determine the feasibility of using a geothermal resource as a low cost substitute for fossil fuels.

204. GGIS-100267/B/ / /A/ / / / /

Title- County Property Taxes Derived from Geothermal Energy Development

Subtitle- January 1977

Author(s)- / Larson , Tod /

Publisher- Geothermal World Publications

Reseda, California

Publication date- 1977

Pagination- Page 337 , 17 Pages

Report/patent- PB-297 889

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / National Science Foundation

AER7508793 /

Corporate Author- California Univ., Riverside

Dry-Lands Research Institute

Riverside , California , USA

Auxiliary expression(s)-

Illus. / Graph (3) /

Table

Ref.

Descriptor(s)- / California / Energy source development / Geothermal fields / Imperial County / Income / Profits / Public utilities / Taxes /

Abstract by TIC

The amount of money that the County of Imperial will receive in property taxes due to geothermal development is estimated. There are two components of property tax revenues from the geothermal fields that are assessed by the County, and the revenues from the utility plant that are assessed by the State Board of Equalization. Data on changes in the tax income of Sonoma County as a result of the development of the Geysers geothermal field are able to get \$3,000 to \$7,000 per Megawatt of installed capacity. The average tax rate in Sonoma County is \$8 (per \$100 assessed). Imperial County is closer to \$10. Imperial County should collect approximately 25% more taxes.

205. GGIS-100058/J/ / /A/ / / / /

Title- Deep Geopressured Waters--

Subtitle- An Alternative Energy Source

Author(s)- / Price , Leigh C. /

Publication date- Vol. 76 , Issue 51 , 1978

Pagination- Page 88 , 4 Pages

Note- This article is a condensation of a paper published in the Proceedings of the Third Conference on Geopressure Geothermal Energy, held at Lafayette, La., Nov. 16-18, 1977

Auxiliary expression(s)-

Illus. / Figure (5) /

Ref.

Descriptor(s)- / Brines / Elevated temperature / Geopressured zones / Gulf Coast / Methane / Natural gas / Permeability / Petroleum / Porosity / Salinity / Sandstone / Sediments /

Abstract by Author (rev.)

A greater awareness has developed of the possibility of utilizing abnormally pressured sand and shale waters in the Gulf Coast as an alternate energy source. Flow rates of 50,000-100,000 bbl of brine per day may allow adequate recovery of geothermal energy and dissolved methane to make commercial production feasible. Jones (1977) gave an overview for this proposed energy source for sediments at temperatures of 100-180 DEG C. However, new data suggest that we should consider the possibility of deeper geothermal-geopressured resource, which would utilize brines at temperatures higher than 180 DEG C. These deeper, hotter waters are more attractive than shallower waters because they have lower salinities and, therefore, will present less of a disposal problem. And they have much greater total energy content in the form of geothermal energy and dissolved oil and gas. This article discusses calculations that were made from aqueous crude oil and natural gas solubility data (Price, 1978) to determine the amount of dissolved oil and dissolved gas that we can expect in sediment formations waters under different natural conditions.

206. GGIS-100058/J/ / 7432/A/ / / / /

Title- Deep Smackover Drilling in Mississippi Reveals Geopressured Oil and Gas

Author(s)- / Parker, Calvin A. /

Journal- Oil and Gas Journal

Publication date- Vol. 74, Issue 32, August 9, 1976

Pagination- Page 95, 4 Pages

Auxiliary expression(s)-

Illus. / Map (3) / Graph (1) / Figure (4) /

Ref.

Descriptor(s)- / Mississippi / Economic geology / Natural gas / Petroleum / United States / Exploration / Basins / Geopressure / Jurassic / Smackover Formation / Petroleum prospecting / Petroleum geology /

Abstract by NTIS

Some geologists who have experience in relatively young geopressured basins often assume that older geopressured rocks have "old" pressures of like origin and nature. This assumption has led to faulty application of "young" basin pressure-prediction techniques involving compaction trends to older basins which may or may not experience undercompaction. Through field examples, the author examines diverse origins for deep Jurassic geopressures in the interior salt of Mississippi, contrasting them with geopressures in Gulf Coast Tertiary. Unlike the latter, which result from loading and

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undercompaction caused by rapid decomposition, the deep Jurassic geopressures appear associated with late geologic events involving inflation and hydrocarbon phase changes. A related purpose is to argue that deep Jurassic reservoirs are not a result of interparticle pores being propped open by geopressure, as happens in the Gulf Coast Tertiary, but rather are due to secondary porosity.

207. GGIS-100222/J/ / /A/ / / / /

Title- Deep, Geopressured Aquifers

Subtitle- A New Energy Source?

Author(s)- / Bernard, William J. /

Journal- Pet. Eng.

Publication date- Vol. 50, Issue 3, March 1978

Pagination- Page 84, 3 Pages

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (1) /

Ref.

Descriptor(s)- / Geopressure resources / Geopressured zones / Gulf Coast / Louisiana / Research programs / Texas / Well testing /

Abstract by TIC

The possibility of developing the geopressure resource from aquifers near existing oil and gas operations is studied, and a method is proposed for recovering geopressured energy. Details are given about the first well to be drilled specifically for Gulf Coast geopressure, which is scheduled for 16,500-Ft. depth. Usable types of energy in geopressured waters are hydraulic, thermal, and natural gas.

208. GGIS-100407/O/ / /A/ / / / /

Title- Dehydration Characteristics of Cotton Seed Hulls and Saw Dust in High Temperature Geothermal Brines

Author(s)- / Kandarpa, Viv / Vetter, O. J. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9, 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4, 1980

Pagination- Page 297, 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
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Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Photo (3) /

Table

Descriptor(s)- / Brines / Chemical reactions / Decomposition / Differential pressure / Dissolved gases / Elevated temperature / Fluids / Gases / Geothermal brines / Lost circulation / Physical properties / Porosity / Porous media / Solutions / Testing / Well circulation /

Abstract by GGIS

The behavior of sawdust and cotton seed hulls in geothermal brines of various temperatures has been studied on a limited basis. Both sawdust and cotton seed hulls, complex organic materials with a cellulosic composition, are potential lost circulation and fluid loss agents in geothermal operations. The reactions between cotton seed hulls and brine at 450 deg F, and cotton seed hulls and deionized water at 450 deg F, with and without dissolved oxygen, were tested. Sawdust was tested for its reaction with brine under static conditions at 200 deg F, 400 deg F, and 450 deg F. Flow tests using brine sawdust and 40 micron discs at 200 deg F and 450 deg F were performed. Results from these experiments suggest that both sawdust and cotton seed hulls could be useful as fluid loss agents and lost circulation agents in geothermal operations.

209. GGIS-100528/O/ / /A/ / / / /

Title- Department of Energy Geopressured Geothermal Program

Author(s)- / Westhusing, Keith /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 3, 4 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Data / Experimental results / Geopressure resources / Gulf Coast / Research / US DOE / Well design / Well testing / Wells of Opportunity /

Abstract by Author

The Geopressured Geothermal Program objectives and methods are reviewed and compared with a summary of results to provide program status regarding its potential as an economically reliable and environmentally acceptable energy source. After ten wells of opportunity tests and having drilled, completed and in the process of testing four design wells we have yet to gain adequate data to fully assess the resource although volumes of gas and the heat, pressures and deliverable volumes of fluids from aquifers have not been as high as desired and estimated. Reservoir volumes of some design wells have proved to be large. Additional long-duration flow periods of geographically dispersed wells of opportunity are required for the continuing assessment of the resource. The more limited budgets for resource confirmation that have been authorized require a modification of the existing development plan and strategy. Proposed modifications are outlined.

210. GGIS-100023/J/ / 5909/A/ / / / /

Title- Depositional Framework of Frio Formation (Oligocene)
(Subdivision into Six Subunits, Foraminiferal Generation,
Depositional Patterns, Structure)
Subtitle- Lower and Middle Texas Gulf Coast
Author(s)- / Bebout , D. G. / Agagu , O. K. /
Publisher- American Association of Petroleum Geologists
Journal- American Association of Petroleum Geologist Bulletin
Publication date- Vol. 59 , Issue 9 , 1975
Pagination- Page 1723 , 1 Pages
Note- SEPM (Gulf Coast) Meeting.
Descriptor(s)- / Texas / Sedimentary petrology / Sedimentation / Sand
/ Shale / Oligocene / Frio Formation / Coastal / United States /
Gulf Coast / Patterns / Structure / Biostratigraphy / Zoning /
Foraminifera / Units / Classification / Deposition / Facies /
Distribution / Evaluation / Resources / Geopressure / Geothermal
energy /

211. GGIS-100440/R/ / /M/ / / / /

**Title- Description, Field Test and Data Analysis of a Controlled
Source EM System (EM-60)**
Author(s)- / Morrison , H. F. / Hoversten , M. / Opplinger , G. /
Goldstein , N. E. / Riveros , C. /
Publication date- October 1978
Pagination- 149 Pages
Report/patent- LBL-7088
Available- Technical Information Dept., Lawrence Berkeley Laboratory
University of California
Berkeley
CA
94720
Local Availability- CES
Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
Geothermal Energy
W-7405-ENG-48 /
Auxiliary expression(s)-
Illus. / Diagram (18) / Figure (1) / Graph (14) / Map (2) / Photo (5) /
Table
Ref.
Descriptor(s)- / Computer codes / Computers / Data analysis /
Electromagnetic surveys / Field studies / Geophysical surveys /
Geothermal exploration / Hydrothermal systems / Magnetotelluric
surveys / Resistivity surveys /
Abstract by Author (rev.)
Electrical and electromagnetic (EM) techniques have been
shown to be useful for delineating either the gross geological
structure or the reservoir region of some convective geothermal
systems. In the LBL/U.C. Berkeley evaluation of geophysical
techniques for geothermal exploration, a successful test was
made in Grass Valley, Nevada, of a prototype frequency-domain EM
system. These experiments showed that the EM soundings gave

interpreted results that compared well with those from dipole-dipole dc resistivity surveys. Based on the need for continued development and demonstration of a field-worthy system, LBL and U.C. Berkeley have developed the EM-60 system, the number related to the 60 kW output of the motor generator used. The system, easily expandable to include time-domain measurements, is designed for use with a large moment, horizontal-coil transmitting antenna. This choice was based on the need to overcome a number of problems encountered in dc resistivity, MT and existing controlled-source EM systems: (1) Because no ground contact is needed, the system is better suited to areas where the contact resistances are high, such as sand-covered desert regions or talus slopes on mountains. (2) A magnetic field detector can be used, thus eliminating the need for long wires, other than the transmitter coil, to be laid out and retrieved. (3) The transmitter can be installed at a convenient location, an especially helpful feature in terrain where access is limited, and a survey around the receiver is conducted by moving the receiver only. (4) Vertical resistivity soundings are made by varying frequency, not transmitter-receiver separation as in dc resistivity, thus avoiding interpretational difficulties introduced by lateral inhomogeneities. (5) By generating an EM field over a broad frequency range (10^{**3} Hz to as low as 10^{**-3} Hz), the sounding curves provide both good resolution of the near surface as well as depth penetration to basement. (6) The system would not depend on natural field activity, and would therefore provide reliable data in bands where the absence of natural signal often leads to incomplete MT data.

212. GGIS-100161/R/ / /M/ / / / /

Title- Design of a Water Jet Drill for Development of Geothermal Resources

Subtitle- Annual Progress Report, June 1, 1976--May 31, 1977

Publication date- 1977

Pagination- 37 Pages

Report/patent- C00-2677-8

Available- NTIS

(Paper copy)

(Microfiche)

Corporate Author- Missouri University, Rolla

Rock Mechanics and Explosives Research Center

Rolla, Missouri, USA

Descriptor(s)- / Boreholes / Drill bits / Jets / Penetration rate /
Rock drilling / Well drilling / Geothermal wells /

Abstract by ERA

Research was expanded to the drilling of crystalline rock. Advance rates of 40 inches per minute have been achieved at 16,000 PSI, 10GPM flow rate in a 30,000 PSI compressive strength rock using the water alone as the drilling mechanism. The quality of the hole achieved as the jet drilled a variety of rock was found to vary and a hydromechanical drilling bit, combining high pressure water jets with roller cones, has been developed. A field drilling unit has been tested and modified to allow the drilling of holes to 3 1/2 inch diameter using the

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hydromechanical drill. Preliminary work on the development of a cavitation test for rock is also included.

213. GGIS-100002/0/ / 1/A/ // //

Title- Detection Methods for Abnormal Fluid Pressures

Author(s)- / Wood , J. J. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 1 , Issue 1 , 1967

Pagination- Page 51 , 30 Pages

Descriptor(s)- / Petroleum / Production / Geopressure / Measuring methods /

214. GGIS-100308/0/ / /A/ // //

Title- Determination of the 5 MW Design Case for Power Production at Raft River

Author(s)- / Ingvarsson , I.J. / Madsen , W.W. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 305 , 4 Pages

Available- Geothermal Resources Council

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Local Availability- CES

Corporate Author- Idaho National Engineering Lab.

Idaho Falls , Idaho , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (2) /

Ref.

Descriptor(s)- / Binary cycle power generation / Elevated temperature

/ Geothermal fluids / Idaho / Renkine cycle / Thermodynamic

cycles / 2-methylpropane /

Abstract by Author

This paper documents a series of Rankine Cycle studies for power generation utilizing geothermal fluid as the heat source and isobutane as the working fluid. To find the plant configuration which would most effectively utilize the available energy, a parametric study was performed. The study considered the desirability of supercritical, single boiler or double cycles, and the relative boiler temperatures and percentage isobutane flow split between the boilers in the double cycles for geothermal fluid temperatures of 260 DEG F to 360 DEG F. This study was designed to discover thermodynamic trends which would

point to an optimum isobutane cycle for geothermal fluid temperatures in this temperature range. The results of the parametric study were applied to derive a Nominal Design Case for a demonstration plant at Raft River, with a geothermal fluid resource at 290 DEG F.

215. GGIS-100533/O/ / /A/ / / / /

Title- Determination of TDS in Geothermal Systems by Well-Log Analysis

Author(s)- / Brown , Susan L. / Gobran , Brian D. / Sanyal , Subir K. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 279 , 9 Pages

Local Availability- GGIS

Corporate Author- Stanford Univ.
Petroleum Research Inst.
CA , USA

Auxiliary expression(s)-

Illus. / Figure (1) / Graph (4) /
Ref.
Table

Descriptor(s)- / Analysis / Chemical analysis methods / Chemical composition / Dissolved solids / Equations / Geothermal reservoirs / Qualitative chemical analysis / Reservoir description / Reservoir fluids / Reservoir properties / Water analysis / Well information systems /

Abstract by GGIS

Four methods are presented for calculating the total dissolved solids (TDS) in the fluid of a geothermal reservoir by using various combinations of well logs: 1) pulsed neutron log and a porosity log; 2) dual induction focused log; 3) an electric log and a porosity log; or 4) spontaneous potential log. In these calculations the lithology, which can alter log readings, and such constants as the resistivity of the mud filtrate and the temperature are taken into account.

216. GGIS-100388/B/ / /M/ / / / /

Title- Determination of Water Resistivity by Computer Analysis of the Induction-Electric Log

Author(s)- / Caudle , Susan Lynette /

Publisher- Texas Univ.
Austin

Publication date- May 1979

Pagination- 143 Pages

Local Availability- CES

Corporate Author- Texas Univ.
Austin , Tx , USA

Auxiliary expression(s)-

Geopressured Geothermal Bibliography

Illus. / Diagram (23) / Graph (2) / Figure (32) /
Table
Ref.

Descriptor(s)- / Algorithms / Computer calculations / Computer codes
/ Data analysis / Equations / Hydrocarbons / Induction logging /
Numerical analysis / Permeability / Producing wells /
Productivity / Resistivity logging / Sp logging /

Abstract by Author

A major source of information for predicting production zones in a newly drilled well is the Induction Electric log. The Spontaneous Potential log measures a voltage in the strata and the Induction Resistivity Log measures the true resistivity of the formation. These estimates generally indicate if a zone is permeable and, if so, if hydrocarbons fill the pore spaces. A computer algorithm is presented which will find possible hydrocarbon-containing zones by the Spontaneous Potential and Induction Electric log values. The program finds the water resistivity of the possible producible zones. Two cases which the program does not allow for are shaly sands and thin zones, but the program can be altered to handle these conditions. The program is also unable to detect shale base line shifts.

217. GGIS-100407/O/ / /A/ / / / /

Title- Development and Testing of Seals and Lubricants for Geothermal Rock Bits

Author(s)- / Hendrickson , R. R. / Winzenreid , R. W. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

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Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy /

Auxiliary expression(s)-

Illus. / Diagram (5) / Graph (2) / Photo (2) /

Table

Ref.

Descriptor(s)- / Bottom hole pressure / Cost / Design / Drill bits /
Drilling equipment / Elastomers / Elevated temperature /
Equipment / Evaluation / Geothermal reservoirs / Laboratory
testing / Lubricants / Polymers / Reservoir properties / Seals /
Specifications / Subsurface temperature / Well characteristics /

Abstract by GGIS

The development of seals and lubricants for geothermal rock bits is discussed in this article. Conventional sealed bits have not been suitable for geothermal drilling because of the temperature limitations on the necessary seals and lubricants; thus the current interest in the improvement of temperature capabilities for these seals and lubricants. This article describes: elastomeric compounds which sealed effectively to temperatures of 288 deg C; mechanical seals for reservoir temperatures over 288 deg C; and newly developed lubricants that meet both lubrication and compatibility requirements. Recommendations are made for several seals and lubricants used in roller-cone bits for high temperature laboratory drilling and field geothermal drilling tests.

218. GGIS-100407/O/ / /A/ / / / /

Title- Development of a Wireline Service for Use in Producing Geothermal Wells

Author(s)- / Garney , T. A. / Roesner , R. E. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 329 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project Manager: Vasei W. Roberts

Available- Geothermal Resources Council

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95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (6) /

Table

Ref.

Descriptor(s)- / Commercialization / Elastomers / Geothermal fields / Geothermal wells / Industry / Measuring instruments / Performance testing / Reservoir temperature / Surface equipment / Technology utilization / Testing / Well logging / Well logging equipment / Wells / Wireline operation /

Abstract by GGIS

A special geothermal logging system, proven in commercial use for two years, is described in this report. This geothermal logging suite and surface support system was developed specifically to handle the demanding conditions of geothermal production. The system includes: high temperature logging instruments that operate in conjunction with a high temperature single conductor logging cable; a special high temperature lubricator and wireline cooler; and surface equipment that includes a geothermal wireline blowout preventer.

219. GGIS-100366/R/ / /M/ / / / /

**Title- Development of an Acoustic Sensor for a Geothermal Borehole
Televiewer**

Author(s)- / Wonn , J. W. /

Publication date- March 1979

Pagination- 268 Pages

Report/patent- ALO-5391-T2

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Department of Energy

DE-AC04-76ET15391 /

Auxiliary expression(s)-

Illus. / Photo. (83) / Diagram (24) / Figure (37) /

Graph (13) /

Table

Ref.

Descriptor(s)- / Boreholes / Fractures / Geothermal exploration /
Measuring instruments / Physical properties / Sonic logging /

Abstract by Author

The objective of this project is to upgrade acoustic sensor technology such that appropriate well logging instruments can be made to operate under the hostile environment conditions anticipated in geothermal resource exploration and evaluation. The Borehole Televiewer (BHTV) was selected as the vehicle for this sensor improvement work, primarily because of its demonstrated ability to detect and characterize fractures under sub-geothermal conditions. This Final Technical report describes the work done toward providing an improved sensor for the televiewer. An experimental sensor concept was devised, incorporating a thin metal acoustic window, an improved, high-temperature internal coupling fluid, and thermally resistant sensor internals. During an autoclave test, it was successfully demonstrated that the resulting experimental sensor design concept provides the basic target detection and characterization functions required of a fracture mapping, Borehole Televiewer under simulated geothermal conditions. In particular, the experimental sensor remained operational at 275 DEG C and 7000 psi.

220. GGIS-100524/R/ / /M/ / / / /

**Title- Development of an Assessment Methodology for Geopressured
Zones of the Upper Gulf Coast Based on a Study of Abnormally
Pressured Gas Fields in South Texas**

Author(s)- / Swanson , R. K. / Oetking , P. / Osaba , J. S. / Hagens
, R. C. /

Publication date- August 1976

Pagination- 122 Pages

Report/patent- C00-2687-S

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Energy Research and Development Administration,
Washington, D.C. (USA). Div. of Geothermal Energy
E(11-1)-2687 /

Descriptor(s)- / Brooks County / Cameron County / Data / Geological
surveys / Geopressured zones / Gulf Coast / Hidalgo County /
Kenedy County / Live Oak County / Natural gas fields /
Permeability / Resource assessment / Temperature distribution /
Temperature measurement / Texas / Willacy County /

Abstract by NTIS

Detailed study of the producing gas fields in south Texas has identified a total of 47 abnormally pressured fields in a six-county area including Hidalgo, Brooks, Cameron, Willacy, Kenedy, and Live Oak Counties. An assessment methodology for assessing the potential of the deep geopressured zone in south Texas as an energy resource was developed, based on investigation of the reservoir parameters of these fields. This methodology is transferrable to broad areas of the Gulf Coast. The depth of the geopressured zone in the study area ranges from 7000 ft in western Hidalgo to 12,000 ft in central Cameron County. Temperature data from within the fields, corrected to undisturbed reservoir values, yields a 300 exp 0 F isogeothermal surface at depths from 10,500 ft to 17,000 ft over the study area. The question of fluid deliverability was found to be paramount in determining the potential of the geopressure-geothermal resource as a practical source of energy. The critical parameter is the effective reservoir permeability throughout the study region. Individual fields were assessed for their potential to produce large quantities of geothermal fluid based on reservoir study and detailed geological investigation. Five locations within the study region have been selected as potential candidates for further evaluation and possible eventual testing. Based on investigation of permeability and temperature, the upper limit of fluid temperature likely to be produced in the lower south Texas study region is 300 exp 0 F. In Live Oak County, the possibility of producing fluid at higher temperatures is somewhat improved, with a reasonable possibility of producing fluid at 350 exp 0 to 375 exp 0 F.

221. GGIS-100070/R/ / 3/M/ / / / /

Title- Development of an Assessment Methodology for Geopressured
Zones of the Upper Gulf Coast Based on a Study of Abnormally
Pressured Gas Fields in South Texas

(300 DEG F Isothermal Surface at 10,500 to 14,000 FT.)

Subtitle- Progress Report, 1 December 1975 - 29 February 1976

Author(s)- / Swanson , R. K. / Oetking , O. P. / Osoba , J. S. /
Hagens , R. C. /

Publication date- Vol. 3 , February 1976

Pagination- 30 Pages

Report/patent- C00--2687-3

Available- NTIS

(Paper copy)

(Microform)

Corporate Author- U.S. Energy Research and Development Administration

Geopressed Geothermal Bibliography

Southwest Research Institute

San Antonio, Texas, USA

Descriptor(s)- / Aquifers / Depth / Geopressed systems / High temperature / Natural gas / Permeability / Sand / Temperature measurement / Texas / USA / Wells / Natural gas fields / Geophysics /

Abstract by ERDA/RECON

Twenty-four separate gas fields producing from geopressed sands have been identified in the South Texas area that includes Hidalgo, Cameron, Willacy and The lower half of Kenedy Counties. Of these, twenty are in Hidalgo County. Geological study and detailed investigation of reservoir parameters in each of the fields have been accomplished. Two areas in particular are discussed in some detail in this paper: the Vicksburg trend on the west, represented by McAllen Ranch Field, and the South Central Frio-Vicksburg Delta, including the McAllen-Pharr-Edinburg area. The depth of the geopressed zone in the study area ranges from 7,000 feet in Western Hidalgo County to 12,000 feet in the Central Cameron County. Temperature data within the fields, corrected to equilibrium value, yields a 300 degree F. isogeothermal surface at depths of 10,500 feet to 14,000 feet over the study area. The most critical reservoir parameter was found to be the effective permeability in all the fields in the region. Permeability values ranged from 0.03 MD to 8.0 MD, with average values over all the fields near 1.0 MD. A permeability profile of McAllen-Pharr shows permeability there to be an inverse function of depth, with effective permeability values from 16 MD above the geopressed zone to 0.03 MD at 14,000 feet. The permeability reduction amounts to approximately one order of magnitude for each 2,000 feet of depth.

222. GGIS-100070/R/ / 3/M/ / / / /

Title- Development of an Assessment Methodology for Geopressed Zones of the Upper Gulf Coast Based on a Study of Abnormally Pressured Gas Fields in South Texas

Subtitle- Progress Report, 1 March 1976 - 31 May 1976

Author(s)- / Swanson, R. K. / Oetking, O. P. / Osoba, J. S. / Hagens, R. C. /

Publication date- Vol. 3, February 1976

Pagination- 24 Pages

Report/patent- C00--2687-3

Available- NTIS

(Paper copy)

(Microform)

Corporate Author- Southwest Research Institute

San Antonio, Texas, USA

Descriptor(s)- / Faults / Geopressed systems / Geothermal resources / Natural gas fields / Natural gas wells / Permeability / Sand / Technology assessment / Texas / Geopressed zones /

Abstract by NTIS

During the fourth quarterly reporting period project change-in-scope was approved extending the study area to include Brooks, the remainder of Kenedy and Live Oak Counties. An interim progress report covering that reporting period is

presented. Effort during the quarter was directed toward (1) locating drillstem and production test results from geopressured formations, (2) determining formation parameters in an additional large number of producing wells, and (3) searching production records for assessment of geopressured production in Brooks and Kenedy Counties. Several unsuccessful completion tests of geopressured water sands (attempted as gas completions) have been located and these give insight into the problems of completing high-volume water wells in that zone. A successful fracture treatment in a geopressured gas well indicates a producibility increase equivalent to a two-fold improvement in permeability. Permeability calculations for a large number of geopressured and normally pressured gas wells throughout the study area have been completed. In no case has a producing Rio Grande Valley gas well deeper than 10,000 FT. been identified with effective permeability as great as 10 MD. Preliminary investigation of Brooks County production has located geopressured production in seven gas fields, and in North Kenedy County an additional three. ERA citation 01:023136)

223. GGIS-100005/0/ / 2/A/ // //

Title- Development of the Nation's Geothermal Energy Resources

Conference- Energy Technology II

Washington, D.C. (May 12 , 1975)

Publisher- Govt. Inst., INC.

Washington, D.C.

Publication date- Vol. 2 , 1975

Pagination- Page 271 , 8 Pages

Auxiliary expression(s)-

Ref.

Table

Descriptor(s)- / Geothermal energy / Research / Energy resources /

Abstract by NTIS

The Energy and Research Administration's plan to implement the demonstration of commercial feasibility of liquid-dominated hydrothermal systems at an accelerated basis and the technical development of advanced systems such as geopressured basins and hot dry rock formations is discussed. Data in tabular form are appended. 10 Refs.

224. GGIS-100455/R/ / /M/ // //

Title- Development of Electrical and Electrochemical Probes for Down Hole and In-Line Chemical Analysis of High Pressure, High Temperature Geothermal Fluids

Author(s)- / Danielson , M.J. / Koski , O.H. / Shannon , D.W. /

Publication date- November 1977

Pagination- 41 Pages

Report/patent- PNL-2459

Available- NTIS

(Paper copy)

(Microfiche)

Geopressured Geothermal Bibliography

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

EY-76-C-06-1830 /

Corporate Author- Batelle Pacific Northwest Labs.

Richland, WA, USA

Auxiliary expression(s)-

Illus. / Diagram (6) / Graph (3) /

Table

Ref.

Descriptor(s)- / Chemical analysis / Corrosion / Development /
Electrical conductivity / Electrical equipment / Field studies /
Geothermal fluids / High pressure / High temperature / Materials
testing / Measuring instruments / Pollution control / Scaling
control / Seals / Water chemistry / Water monitoring /

Abstract by Author

The objective of this study for FY 1977 was to develop a reference electrode and conductivity probe that would operate in the geothermal environment and provide data. The conditions of the geothermal environment to which the probes must operate were defined as 250 deg C, widely varying salinity, large amounts of dissolved CO₂, and H₂S, and the potential for deposition of mineral scale. This work also involved a study of sealing materials. Midway through the work, a field test was carried out at East Mesa, 6-1 well which involved the reference electrode, electrodeless conductivity probe, redox electrode, and instantaneous corrosion rate measurement (by linear polarization). A high temperature-pressure, thermodynamic reference electrode was developed which was demonstrated to be operative in a simulated geothermal environment up to 250 deg C containing the contaminants that would affect its operation. This probe is an essential part of all electrochemical measurements of pH, oxidation potential, or sulfide ions. An electrodeless conductivity probe was developed for use in the geothermal environment. This design is particularly resistant to the effects of scale deposition. Development of this probe required the solution of a seal problem which will be useful to solving other seal problems in the geothermal industry. This probe should be useful for measuring salinity, steam/brine ratios in two-phase flow, flashing point, and as a liquid-level control. A large number of sealing materials were investigated for use in the 250 deg C geothermal environment. From this study, PNL has developed a spring-loaded seal that may have other applications in the geothermal industry. The field test of the conductivity probe and reference electrode at East Mesa was a success. The conductivity probe successfully predicted the total dissolved solids content of the brine, and the redox probe data coupled with Pourbaix diagrams indicated FeS and FeS₂ as surface film present on the electrodes and test loop. Instantaneous corrosion rate methods were demonstrated to be easily set up and convenient to operate. The conductivity probe and reference electrode are now ready for further field tests which must be conducted in the future in order to demonstrate the usefulness of these devices and to test reliability.

225. GGIS-100102/R/ / /M/ / / / /

Title- Development of Geothermal Reservoirs from Overpressured Areas Beneath the Gulf Coastal Plain of Texas
 (Final Report)
Subtitle- A Feasibility Study of Power Production from Overpressured Reservoirs
Author(s)- / Herrin , E. /
Publication date- March 1973
Report/patent- AD--766855-1
Available- NTIS)
Corporate Author- Southern Methodist University
 Dallas , Texas , USA
Descriptor(s)- / Boreholes / Ecology / Electric power /

226. GGIS-100308/0/ / /A/ / / / /

Title- Development of Geothermal Well Completion Systems--
Subtitle- I.
Author(s)- / Eilers , L.H. / Moran , L.K. / Nelson , E.B. / Spangle , L.B. / Simpson , B.E. / Williams , J.F. /
Conference- Geothermal Resources Council 2nd Annual Meeting
 Hilo
 Hawaii
 USA (July 25 , 1978)
Publisher- Geothermal Resources Council
 Davis, California
Publication date- Vol. 2 , Issue 1 , 1978
Pagination- Page 173 , 3 Pages
Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 California
 95616
Local Availability- CES
Corporate Author- Dow Chemical Co.
 Dowell Div.
 Tulsa , Oklahoma , USA
Auxiliary expression(s)-
 Table
 Ref.
Descriptor(s)- / Geothermal wells / Well cementing / Well completion /
Abstract by Author
 Cementing of geothermal wells requires special consideration because of unusual conditions of temperature, corrosive fluids, and fragile formations. Systems traditionally used in oil and gas well cementing may not function predictably in harsh geothermal environments thus leading to cement failure and costly blow-outs. The current research program consists of two phases--(1) definition of problem/determination of requirements and (2) development of a cementing system which will function effectively over long periods of time at the specified conditions. Phase I has been completed and preliminary Phase II results will be reported in this work.

227. GGIS-100308/0/ / /A/ / / / /

Title- Development of Improved Rotary Seals for Downhole Motors in Geothermal Applications

Author(s)- / Black , Alan D. / Wilson , James G. / Green , Sidney J. / Nixon , Jeddy D. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 51 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Terra Tek, Inc.

Salt Lake City , Utah , USA

Corporate Author- Maurer Engineering, Inc.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Diagram (5) / Graph (1) / Photo (4) /
Table

Descriptor(s)- / Bearings / Drill bits / Geothermal wells / High temperature / Seals / Well drilling /

Abstract by Author

The major limitation of downhole mud motors for geothermal well drilling as well as straighthole oil and gas well drilling is the bearing section. Reduced bearing life has been a direct result of the inability to seal lubricant in the bearing section. Along with extending bearing life, a reliable rotary seal is needed to allow high pressure drops across the drill bit for improved bottomhole cleaning and increased drilling rate. A new approach to the development of an improved rotary seal is being carried out. The performance of candidate "high temperature" rotary seals compared with "standard" industry seals is being measured in a full-scale laboratory seal tester capable of simulating the temperatures, pressures and dynamic conditions of geothermal well drilling. A description of the candidate "high temperature" seals, the seal tester and current seal test results and findings are presented.

228. GGIS-100995/ / / /A/ / / / /

Title- Development of Injection Criteria for Geothermal Resources

Author(s)- / Tewhey , John D. / Chan , Marjorie A. / Kasameyer , Paul W. / Owen , Lawrence B. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 649 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98
Davis
California
95616

Local Availability- CES

Sponsor- / U.S. Energy Research and Development Administration

W-7405-Eng-48 /

Corporate Author- California Univ., Livermore

Lawrence Livermore Lab.

Livermore, California, USA

Auxiliary expression(s)-

Illus. / Photo (4) / Graph (8) /

Descriptor(s)- / Filtration / Geothermal brines / Geothermal resources / Hot water systems / Moderate temperature / pH value / Reservoir pressure / Salton Sea / Solids / Waste injection /

Abstract by Author

The ability to inject large quantities of brine effluent will be an important factor in the development of liquid-dominated geothermal systems. Experimental studies have been conducted by the Earth Science Division of the Lawrence Livermore Laboratory to evaluate injection of "spent" geothermal brine at the Salton Sea Geothermal Field. The studies have dealt principally with the injectability of suspended solids that are produced in the brine during the energy conversion process. In the experimental plan the subsurface medium was represented by membrane filters with pore diameters ranging from 0.4 to 10 microns and by sandstone core material. Changes in permeability with time were evaluated with respect to the following variables: (1) prefiltration of brine upstream from the core or membrane filter, (2) brine temperature (20 DEG C to 100 DEG C), (3) brine pH and (4) confining pressure.

229. GGIS-100407/O/ / /A/ / / / /

Title- Development of Turbodrill Tachometer

Author(s)- / McDonald, William J. / Maurer, William C. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 301 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project Manager: Vasek W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Sponsor- / Department of Energy, Morgantown, WV (USA). Morgantown Energy Research Center

DE-AC21-79MC11251 /

Geopressured Geothermal Bibliography

Auxiliary expression(s)-

Illus. / Diagram (5) / Graph (2) / Photo (1) /
Table
Ref.

Descriptor(s)- / Drill bits / Drilling / Drilling equipment /
Equipment / Geothermal drilling / Geothermal wells / Laboratory
testing / Measurement / Measuring instruments / Noise / Pressure
measurement / Pumps / Well drilling / Wells /

Abstract by GGIS

A turbodrill tachometer which has worked effectively at over 10,000 ft. has been developed for geothermal operations. The importance of this mud pulse turbodrill tachometer is its contribution to the control of turbodrill speed; because the tachometer lets the driller continually monitor his speed, he can control his speed. Thus, using the tachometer yields improved drilling motor operations and longer bit life. Recommendations for further development include improving signal processing techniques which would allow simpler field operation.

230. GGIS-100024/B/ / 11/A/ // //

Title- Diagenesis of Gulf Coast Clayey Sediments and its Possible
Relation to Petroleum Migration
(Paper 6 in Abnormal Subsurface Pressure- Selected Papers from
AAPG Bulletin)

Author(s)- / Burst , John F. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 11, 1974

Pagination- Page 98, 21 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Gulf Coast / Sedimentation / Sedimentary petrology /
Diagenesis / Tertiary / Clay minerals / Dehydration / Water /
Reactions / Models / Clay / Shale / Relation / Petroleum /
Migration / Geopressure / United States /

Abstract by Author

The author has established reference intervals in the subsurface on the basis of apparent systematic interlayer water loss of swelling clay minerals. The intervals are used in much the same manner as the familiar indicators for metamorphism, but are present at sufficiently shallow depths to be evident within oil-bearing strata of the Gulf Coast. The resulting conclusion is that clay-mineral diagenesis indicators may prove to be important petroleum-evaluation markers as well as fundamental properties of sedimentary basins. Sedimentary basins are viewed as combinations of gases, liquids, and semisolids distributed through a solid matrix. During geologic development the interstitial components segregate by migration and produce various commercially exploitable concentrations. Water, the principal fluid component of the sedimentary section, is thought to migrate in three separate stages. Petroleum hydrocarbons which are distributed throughout the matrices of potential source beds in normal frequencies of 300-3,000 ppm are thought to be too sparse to initiate continuous fluid flow. In normal marine sediments, however, the water associated with clay minerals is present to a considerable depth in the order of

200,000 ppm, and therefore it is reasoned that this phase forms the connection between petroleum source and reservoir beds. The first and last dehydration stages are probably unimportant in Gulf Coast oil migration, inasmuch as they occur, respectively, at levels too shallow and too deep to intersect the interval of maximum liquid petroleum availability. The amount of water in movement during the second stage, at a level which does intersect this interval, is 10-15% of the compacted bulk volume and represents a significant fluid displacement capable of redistributing any mobile subsurface component. A measure of the degree to which the second-stage interlayer water has been discharged into the system can be noted on X-ray diffractograms. The movement appears to occur in a relatively restricted, depth-dependent temperature zone in which the average dehydration temperature of the points measured is 221 DEG F. With the use of an empirically derived P/T curve and a geothermal-gradient map, a set of regional subsurface dehydration contours can be constructed. It was found that hydrocarbon production depths are distributed in a statistically consistent relation to the calculated clay-dehydration contour surface.

231. GGIS-100265/J/ / /A/ / / / /

Title- Digging Deeper Eases Threat of Gas Shortages

Journal- Chem. Week

Publication date- Vol. 123 , Issue 22 , November 29 , 1978

Pagination- Page 11 , 2 Pages

Auxiliary expression(s)-

Illus. / Map (1) /

Descriptor(s)- / Aquifers / Cost / Devonian period / Energy demand / Energy sources / Gas production / Geopressured reservoirs / Gulf Coast / Natural gas deposits / USA /

Abstract by Energyline

Recent favorable developments and more optimistic projections of new natural gas sources suggest that supplies through 1990-2000 will be at least adequate. Supplementary gas sources, unconventional sources, expanded reserve estimates, and new exploration in deep offshore and onshore areas contribute to the new optimism, contrary to the specter of dire shortages previously predicted. Reserve and cost estimates from western gas sands, coal-seam gas, geopressured aquifers, and deep basins are presented.

232. GGIS-100407/O/ / /A/ / / / /

Title- Dimensional Analysis of an Economic Model for a Hot-Water Geothermal Heating System

Author(s)- / Kauffman , David / Houghton , Arthur V. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Geopressured Geothermal Bibliography

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4, 1980

Pagination- Page 727, 3 Pages

Note- Subcontract 852-0030-KX to Rockwell International EPRI Project
Manager: Vasek W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Sponsor- / New Mexico Energy and Minerals Dept., Santa Fe (USA) /

Auxiliary expression(s)-

Illus. / Graph (2) /

Ref.

Descriptor(s)- / Calculation methods / Comparative evaluations / Cost
/ Economic analysis / Equations / Feasibility analysis / Fossil
fuels / Geothermal fluids / Geothermal heating / Mathematical
methods / Mathematical models / Numerical solution /

Abstract by GGIS

An economic model has been designed for the evaluation of
geothermal hot water heating for large institutional systems.
The first design step was to develop a complex model; the second
was to apply the Buckingham Pi technique to the model. This
technique allowed the complex model to be reduced to a minimum
set of dimensionless groups, resulting in an equation that
compares the overall cost of using a geothermal hot water heating
system to the cost of continued use of the present system.

233. GGIS-100899/0/ / /A/ / / / /

Title- Direct Applications of Geothermal Energy

Author(s)- / Schmitt, R.C. / Schultz, R.J. / Griffith, J.L. /
Brown, W.S. /

Conference- 11 Intersociety Energy Conversion Engineering Conference

Pagination- Page 815, 7 Pages

Report/patent- SAE--769141

Note- Work performed under cognizance of the U.S. Energy Research and
Development Administration Geothermal Energy Division.

Corporate Author- Idaho National Engineering Lab.

Idaho Falls, Idaho, USA

Auxiliary expression(s)-

Illus. / Map (1) / Figure (1) /

Table

Ref.

Descriptor(s)- / Demonstration programs / Direct energy utilization /
Geothermal energy / Idaho / Moderate temperature / Raft River
KGRA / Space heating /

Abstract by Author

The direct application of geothermal energy commenced in the
United States in the late 1800's, but utilization has developed
on a very limited scale. The U.S. Energy Research and
Development Administration's Idaho National Engineering
Laboratory has engaged in expanding the scope of applications
and in stimulating the utilization of the low-to-intermediate

temperature hydrothermal resources. The techniques currently being used to stimulate growth of the industry include the proposed Geothermal Loan Guarantee Program, compilations of engineering and economic analyses, resource/utilization surveys, demonstration or field verification unit development, and various technology transfer mechanisms. Geothermal energy can be used for almost any activity requiring large quantities of heat at relatively low temperatures. Several types of demonstration and field verification projects have been initiated by the INEL to illustrate this viability. These project areas are central space heating districts, large building space heating using low temperature resources, industrial food processing, agriculture uses and aquaculture. Information which is provided on these project areas includes process type, location, technical problems and goals, and status and schedules.

234. GGIS-100899/0/ / /A/ / / / /

Title- Direct Contact Heat Exchangers for Geothermal Power Plants

Author(s)- / Boehm , R. / Jacobs , H. / Bliss , R. / Kelly , D. /

Conference- 11 Intersociety Energy Conversion Engineering Conference

Pagination- Page 754 , 7 Pages

Report/patent- SAE--769131

Sponsor- / U.S. Energy Research and Development Administration

E(10-1)1523 /

Corporate Author- Utah Univ., Salt Lake City

Mechanical and Industrial Engineering Dept.

Salt Lake City , Utah , USA

Auxiliary expression(s)-

Illus. / Diagram (5) / Graph (10) /

Table

Ref.

Descriptor(s)- / Boilers / Design / Geothermal brines / Geothermal power plants / Heat exchangers / Performance testing / Turbines /

Abstract by Author

Several details relating to the design considerations for geothermal power plants using direct contact heat exchangers are given. Primary emphasis is given here to boiler and turbine parameters. Reports are outlined of tests of various types of heat exchangers in our laboratory and at the Raft River Geothermal Well. Also discussed are various parameters that affect the operation of turbines that utilize a mixture of two vapors.

235. GGIS-100309/R/ / /M/ / / / /

Title- Direct Utilization of Geothermal Energy

Subtitle- A Symposium

Conference- Direct Utilization of Geothermal Energy : A Symposium

San Diego

California

USA (January 31 , 1978)

Publication date- January 31 , 1978

Geopressured Geothermal Bibliography

Pagination- 145 Pages
Report/patent- CONF--780133
Local Availability- CES
Sponsor- / U.S. Department of Energy
EY-76-S-03-1340 /
Corporate Author- Geothermal Resources Council
Davis , California , USA

236. GGIS-100528/O/ / /A/ / / / /

Title- Dispersed-Gas Resources and Enhanced Gas Recovery
Author(s)- / Groat , C.G. /
Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)
Publication date- 1981
Pagination- Page 247 , 1 Pages
Local Availability- GGIS
Local Availability- CES
Descriptor(s)- / Enhanced recovery / Gas production / Geopressured reservoirs / Gulf Coast / Methane / Research programs /
Abstract by GGIS
An introduction to the papers discussing dispersed gas resources and enhanced gas recovery is presented. In the 1970s, increasing attention has been given to factors related to the methane content in geopressured fluids.

237. GGIS-100308/O/ / /A/ / / / /

Title- Disposal of Liquid Effluents from Geothermal Installations
Author(s)- / Defferding , Leo J. / Walter , Ron A. /
Conference- Geothermal Resources Council 2nd Annual Meeting
Hilo
Hawaii
USA (July 25 , 1978)
Publisher- Geothermal Resources Council
Davis, California
Publication date- Vol. 2 , Issue 1 , 1978
Pagination- Page 141 , 4 Pages
Available- Geothermal Resources Council
P.O. Box 98
Davis
California
95616
Local Availability- CES
Corporate Author- Batelle Pacific Northwest Labs.
Richland , Washington , USA
Auxiliary expression(s)-
Table
Ref.
Descriptor(s)- / Economics / Environmental effects / Geothermal fluids / Waste disposal / Waste injection / Waste water /
Abstract by Author
The disposal of spent geothermal fluids from power plants and nonelectric installations is a major expense to the resource

developer. Subsurface injection, the most favored of all disposal options, accounts for 10-20% of the cost of power from a binary fluid cycle power plant. The disposal of liquid effluents has been successfully demonstrated at a number of geothermal sites but numerous technological difficulties must often be overcome, including hostile fluid chemistry, large disposal volumes, adverse environmental impacts, the site-specific nature of each geothermal resource, and the lack of geothermal reservoir definition. A summary of the applicability of various disposal options is provided. A number of areas are identified where additional work on disposal can result in more economical and reliable disposal systems.

238. GGIS-100393/0/ / /A/ / / / /

Title- Distribution of Geopressed-Geothermal Energy in Reservoir Fluids of the Northern Gulf of Mexico Basin

Author(s)- / Wallace , Raymond M., Jr. /

Publisher- 4th Geopressed Geothermal Energy Conference

Publication date- Vol. 3, June 1980

Pagination- Page 1087, 49 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Corporate Author- Geological Survey

Bay St. Louis , MS , USA

Auxiliary expression(s)-

Illus. / Diagram (5) / Graph (2) / Map (13) /

Ref.

Descriptor(s)- / Distribution / Exploration methods / Geopressure exploration / Geopressure resources / Geopressed zones / Gulf Coast / Louisiana / Maps / Methane / Reservoir fluids / Resource assessment / Texas /

Abstract by Author

An estimated 17,000 quintillion (10^{18}) joules of thermal and thermal-equivalent methane energy comprises the resource base (energy in place) in reservoir fluids in sandstone underlying a 120,000 square mile (310,000 square kilometer) area of the northern Gulf of Mexico basin. Almost 50 percent of this energy occurs beneath the Federal Outer Continental Shelf (OCS) area, 24 percent or less beneath Louisiana, and the remainder beneath Texas. In 44 areas, a thermal energy content of 60 quadrillion (10^{15}) joules per square kilometer or more occurs below the depth of occurrence of geopressure to a depth of 22,500 feet (6.86 kilometers) below mean sea level. Dissolved methane content exceeds 30 billion (10^9) standard cubic feet per square kilometer in 29 areas. Most of these areas are located within about six trends of high energy concentration that occur outside the areas of shallowest occurrence of geopressure. A preliminary examination of the high energy content areas occurring offshore the northern Gulf of Mexico basin has

Geopressured Geothermal Bibliography

resulted in the designation of five new geopressured-geothermal prospects with excellent sandstone thicknesses and favorable pressure and temperature conditions. The potential for economically extracting dissolved methane from water is the most attractive aspect of these new prospects.

239. GGIS-100252/R/ / /M/ / / / /

Title- Documentation for Program OGRE

Author(s)- / Weres , O. / Schroeder , R. C. /

Publication date- June 1978

Pagination- 61 Pages

Report/patent- LBL-7060

Corporate Author- California University, Berkeley

Lawrence Berkeley Laboratories

Berkeley , California , USA

Descriptor(s)- / Computer codes / Computerized simulation /
Documentation / Geothermal reservoirs / Simulation /

Abstract by TIC

The program OGRE is fully operational and allows construction of a grid made up of closed N-sided polygons in 3-space for use in reservoir simulation. The output of the grid construction from OGRE is input for the two-phase reservoir simulator SHAFT78. The output could be made compatible with any of the other related integrated finite difference programs which have evolved from the original trump program. The input to OGRE is simple, consisting basically of one card defining the number of real elements and dummy elements followed by the X, Y, and Z coordinates of each of the elements. The output provides the interface distances and cross-sectional areas, and the element volumes. The plotting of the resulting calculation grid is automatic when the control cards are used as shown.

240. GGIS-100528/O/ / /A/ / / / /

Title- Down-Hole Sampling at Wells of Opportunity

(Addendum)

Author(s)- / Osif , Terry L. / Foh , Stephen E. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC03-80ET-27081 /

Descriptor(s)- / Analysis / Downhole sampling / Engineering / Gas analysis / Geopressured reservoirs / Sampling methods / Well characteristics / Wells of opportunity /

Abstract by GGIS

Bottomhole sampling is an important early aspect to IGT programs for understanding the basic science of producing energy from geopressured aquifers. These samples provide the concentrations of all brine species that achieve material

balance between the gaseous, liquid, and solid phases that coexist at the surface. Bottomhole sampling could become unnecessary if surface sampling, sample analysis, and computational procedures are eventually validated.

241. GGIS-100212/O/ / /A/ / / / /

Title- Drill Stem Testing and Sampling of Geopressured Brines

Author(s)- / Edwards , A. G. / Montgomery , J. M. /

Conference- 1. Workshop on Sampling Geothermal Effluents

Las Vegas

Nevada

USA (October 20 , 1975)

Publication date- May 1976

Pagination- Page 97 , 17 Pages

Report/patent- EPA-600/9-76-011

Corporate Author- Environmental Protection Agency

Environmental Monitoring and Support Lab.

Las Vegas , Nevada , USA

Corporate Author- Halliburton Services

Duncan , Oklahoma , USA

Descriptor(s)- / Brines / Equipment / Flow rate / Geopressured systems / Geothermal fluids / Geothermal wells / Permeability / Pressure dependence / Pressure measurement / Sampling / Testing /

Abstract by DOE/RECON

Technology and equipment are available today for obtaining samples and reservoir data on geopressured and most geothermal wells. The ultra-deep search for hydrocarbons has fostered development of subsurface equipment capable of withstanding pressure differentials of 10,000 PSI at 500 DEG F. This equipment has been successfully used in a limited number of geothermal wells but has seen wide usage in the oil field. In addition to obtaining samples of the formation effluents, the following formation characteristics can be calculated: static reservoir pressure, indicated flow capacity, transmissibility, average effective permeability, damage ratio theoretical potential with damage removed, and the approximate radius of investigation.

242. GGIS-100411/O/ / 1/A/ / / / /

Title- Drill-Stem Testing and Sampling of Deep Frio and Wilcox Reservoirs

Author(s)- / Montgomery , J. M. /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 206 , 9 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Geopressured Geothermal Bibliography

Auxiliary expression(s)-

Illus. / Figure (6) / Drawing (6) /

Ref.

Descriptor(s)- / Boreholes / Electrical surveys / Flow rate /
Geopressured systems / Permeability / Sampling / Temperature
measurement / Testing / Texas / Well logging /

Abstract by Author

Methods of sampling and evaluating geopressured geothermal aquifers in extreme South Texas are discussed. The area of investigation includes Starr, Hidalgo, Kenedey Willacy, and Cameron Counties in the Texas Valley and covers representative methods of evaluating the Frio Formation (Oligocene) and the Wilcox Formation (Eocene).

243. GGIS-100082/O/ / /M/ / / / /

Title- Drilling and Well Completion Problems in Geopressured Formations of the Carpathian Basin

Author(s)- / Alliquander, O. / Csaba, J. /

Publisher- American Institute of Mining, Metallurgical, and Petroleum Engineers
New York

Publication date- 1976

Report/patent- CONF-760477-13

Descriptor(s)- / Blowouts / Geopressured systems / Hungary / Oil wells
/ Well completion / Well drilling /

Abstract by ERDA/RECON

Exploration drilling in the Carpathian Basin is extremely risky in view of the presence of overpressured formations. This can easily cause blowouts. The simultaneous use of drilling rate and modified "D" factor logs combined with a calculated log of the drillability factor has proved to be a suitable method for detecting relatively thin, overpressured transition formations. A complementary method exists in observing changes in flowline mud temperature. Bringing the deeper, heavily overpressured reservoirs into production is also a most difficult job. Perforating the casing at a depth of 4,000 M will easily result in a rapid production decline because of the early closing of the overpressured reservoirs and because rock debris fills the well. Acid fracturing and opening only the most permeable intervals seems to be the best method of maintaining well productivity.

244. GGIS-100239/J/ / /A/ / / / /

Title- Drilling for Energy Alternatives

Publication date- Vol. 14, Issue 6, February 1980

Pagination- Page 25, 2 Pages

Descriptor(s)- / Aquifers / Drilling / Geopressure resources / Gulf Coast / Louisiana / Methane / Testing /

Abstract by WRA

According to the Louisiana Department of Natural Resources, as much as forty million gallons per well per day of geopressured water at temperatures from 250-400F can be withdrawn from the

coastal zone aquifers. In addition, it is estimated that over 13.6 trillion standard cubic feet of dissolved methane gas is contained in these aquifers, and downhole pressures may attain one psi per foot of depth. Test wells are expected to exceed 10,000 feet in depth and cost about \$10 million each. Disadvantages of geopressure drilling and production are; (1) wells must be widely spaced; (2) land subsidence could occur; (3) brine disposal may cause pollution; and (4) oil and gas production may be reduced.

245. GGIS-100155/J/ / /A/ / / / /

Title- Drilling for New Sources of Energy

Publication date- Vol. 39 , Issue 12 , September 1978

Pagination- Page 134 , 1 Pages

Descriptor(s)- / Drilling / Electric potential / Geopressure /
Geopressed reservoirs / Hot water systems / Power generation /
US DOE /

Abstract by WRA

General Crude Oil Co. and the U.S. Department of Energy will spend up to \$8 million on the first geopressed-geothermal test well. At a target depth of 16,500 ft., researchers hope to find large bodies of overpressured hot water trapped in sedimentary layers which can be used for electric power generation. In addition, the hot water may contain as much as 82 trillion cu.ft. Gulf Coast is one of several projects around the country. Other geothermal experimental drilling can be found on the U.S. East Coast and in Idaho.

246. GGIS-100407/O/ / /A/ / / / /

Title- Drilling Fluid/Formation Interaction at Simulated in situ Geothermal Conditions

Author(s)- / Enniss , D. O. / Bergosh , J. L. / Butlers , S. W. /
Jones , A. H. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
Salt Lake City
Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 285 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council
P.O. Box 98
Davis
CA
95616

Local Availability- GGIS

Sponsor- / Sandia Labs., Albuquerque, NM (USA)
13-9407 /

Geopressured Geothermal Bibliography

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (6) /

Ref.

Descriptor(s)- / California / Circulation / Drilling fluids /
Formation damage / Fluid pressure / Geothermal reservoirs /
Geothermal wells / Imperial Valley / Permeability / Productivity
/ Reservoir pressure / Simulation / USA /

Abstract by GGIS

In the situation where drilling mud invades the geothermal reservoir formation and reduces the formation's permeability, "formation damage" is encountered. The nature of the geothermal well, with its particular temperature, lithological formations and fracture dominated formation, suggests that geothermal reservoirs may be particularly susceptible to formation damage, thereby reducing the productivity of the well. The simulated in situ geothermal conditions of overburden stress, pore fluid pressure, temperature and pore fluid chemistry have provided an opportunity to study the interaction of drilling fluids and geothermal reservoir formation. Formation damage in an East Mesa KGRA geothermal well is evaluated as a function of temperature, drilling fluid and stagnant time. Results show these parameters are significant with respect to the extent and reversibility of the permeability impairment.

247. GGIS-100266/R/ / /M/ / / / /

Title- Ecological Implications of Geopressured-Geothermal Energy
Development, Texas-Louisiana Gulf Coast Region

Author(s)- / Gustavson, Thomas C. / McGraw, M.M. / Tandy, Mills /
Parker, Faust / Wohlschlag, Donald E. /

Publication date- August 1977

Pagination- 670 Pages

Report/patent- PB-287 817/1st

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / Fish and Wildlife Service

DI-14-16-0008-2141 /

Corporate Author- Texas Univ., Austin

Bureau of Economic Geology

Austin, Texas, USA

Corporate Author- Texas Univ., Port Aransas

Marine Science Institute

Port Aransas, Texas, USA

Auxiliary expression(s)-

Illus. / Figure (38) /

Table

Descriptor(s)- / Animals / Commercialization / Energy source
development / Ecology / Electric power / Environmental effects /
Exploitation / Fishes / Geopressure resources / Geothermal
energy conversion / Gulf Coast / Louisiana / Power generation /
Texas /

Abstract by TIC

This report reviews the ramifications of commercial development
of thermal-hydraulic energy for the generation of electrical

power. It includes an extensive review of information regarding fish and wildlife, and the estimated impact from geothermal developments; a review of geothermal energy conversion systems, contrasting them with alternate systems; and a listing of unique or endangered species within the region.

248. GGIS-100358/R/ / /M/ / / / /

Title- Economic and Financial Evaluation of Geopressured-Geothermal Resource Development

(Geopressured-Geothermal Technical Paper No. 2)

Publication date- July 1979

Pagination- 104 Pages

Report/patent- DOE/ET/28464-1 (vol. 2)

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Department of Energy

ET-78-G-05-5958 /

Corporate Author- RPC, Inc.

Austin , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (1) /

Table

Ref.

Descriptor(s)- / Cost / Energy source development / Energy policy / Feasibility studies / Financing / Drilling / Geopressure resources / Leasing / Models / Public lands / Texas /

Abstract by Author

The purpose of the financial analysis was to provide the School Land Board and General Land Office of Texas with an analytical framework for analyzing the effect of leasing policies on the financial feasibility of geopressure geothermal field development. Such an analytical framework was developed and was applied to eleven sets of development assumptions. The analytical framework, its applications, and results are discussed in this paper.

249. GGIS-100411/O/ / 1/A/ / / / /

Title- Economic Analysis of the Use of Texas Geopressured Geothermal Resources for the Production of Electrical Power

Author(s)- / Wilson , John S. / Shepherd , B. P. / Kaufman , S. /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 267 , 15 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Geopressured Geothermal Bibliography

Auxiliary expression(s)-

Illus. / Diagram (3) / Graph (6) /
Table

Descriptor(s)- / Binary fluid systems / Cost / Economics / Flashed
steam systems / Geopressured systems / Geothermal energy
conversion / Geothermal power plants / Geothermal resources /
Methane / Texas / USA / Geothermal energy / Geo brine / Capital
costs / Proceedings /

Abstract by Author

Two geopressured geothermal-reservoir sands in South Texas were identified and described. Power production from these reservoirs was evaluated, using both flash and secondary-fluid systems. Results indicated water yields sufficient to power a 25-MW plant in one reservoir and a 60-MW plant in the second. Economics of plants were most favorable in the latter, where a two-flash system gave power at 26.8 MILS per kilowatt hour as compared to the secondary isobutane system at 33.3 MILS per kilowatt hours. Both values assume credit for 30 SCF methane per barrel of water. Power-cost calculations show this power to be competitive for 50-MW and larger plants at 20 percent return on investment. Using 15 percent return on investment, this power source is shown to be very competitive. All costs are given on a 1980 basis, assuming a 5 percent annual inflation rate.

250. GGIS-100995/ / / /A/ / / / /

Title- Economic Feasibility Mode for Direct Heat Applications of
Geothermal Energy

Author(s)- / Larson, Tod C. /

Publication date- Vol. 2, Issue 2, 1978

Pagination- Page 395, 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Sponsor- / U.S. Department of Energy

ET-78-C-03-1529 /

Auxiliary expression(s)-

Table

Descriptor(s)- / Commercialization / Direct energy utilization /
Economics / Geothermal energy / Investment / Models / Uses /

Abstract by Author

An Economic Feasibility Model (GEYSER) to determine the viability of direct heat applications of geothermal energy is described. The Price of the Product or the Return on Investment can be determined given the required economic parameters. Variables can be adjusted to perform sensitivity analysis, the key economic variables can be highlighted, and the range of profitability can be forecasted.

251. GGIS-100437/R/ / /M/ / / / /

Title- Economic Incentives for Improved Geothermal Drilling Motors

Author(s)- / Maurer , William C. /

Publication date- December 8 , 1976

Report/patent- TID-28708

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of

Geothermal Energy

EG-76-C-07-1581 /

Corporate Author- Maurer Engineering, Inc.

Houston , TX , USA

Auxiliary expression(s)-

Illus. / Diagram (20) / Graph (5) / Photo (4) /

Ref.

Descriptor(s)- / Blowouts / Corrosion / Cost / Directional drilling /

Drill bits / Drill collars / Drilling equipment / Fatigue /

Financial incentives / Fractures / Geopressed zones /

Geothermal drilling / Lost circulation / Penetration rate /

Subsurface temperature / Well casings /

Abstract by Author

Improved drilling motors could produce significant cost reductions in geothermal drilling because of severe problems encountered in geothermal drilling including the following: (1) High rock strengths; (2) High temperatures; (3) Abnormally low formation pressures (hard rock areas); (4) Abnormally high formation pressures (geopressed areas); (5) Fractured formations; (6) Lost circulation problems; (7) Low drilling rates; (8) Low bit footage; (9) Severe drill string corrosion. Because of the hardness of the rocks and high temperature problems, the cost of drilling geothermal wells is 2 to 3 times higher than the cost of drilling comparable oil and gas wells. The cost of these geothermal wells must be significantly reduced before geothermal energy can be fully exploited. Faster drilling rates are needed to allow the development of geothermal resources with the rigs currently available. Essentially all available land drilling rigs in the United States are currently being used and few rigs are available for geothermal drilling. It will take 3 to 5 years to significantly increase the number of drilling rigs so it is important that methods be developed to allow available rigs to drill faster. Reliable high temperature drilling motors could reduce geothermal drilling costs in the following ways: (1) Faster drilling; (2) Increased bit footage; (3) Improved fractured rock drilling; (4) Improved directional drilling; (5) Reduced hole deviation; (6) Reduced blowouts; (7) Reduced casing wear; (8) Reduced keyseating; (9) Reduced twistoffs; (10) Improved milling operations; (11) Improved sidetracking; (12) Improved slim hole drilling; (13) Reduced mud problems; (14) Reduced lost circulation; (15) Reduced drillstring corrosion; (16) Reduced drillstring vibrations; (17) Improved data telemetry; (18) Reduced drillstring fatigue failures.

252. GGIS-100899/0/ / /A/ / / / /

Title- Economic Optimization of Binary Fluid Cycle Power Plants for Geothermal Systems

Author(s)- / Walter , Ronald A. / Wilson , Stephen W. /

Conference- 11 Intersociety Energy Conversion Engineering Conference

State Line

Nevada

USA (September 12 , 1976)

Publication date- Vol. 1 , September 12 , 1976

Pagination- Page 731 , 8 Pages

Note- Work performed under the auspices of the U.S. Energy and Research Development Administration

Available- American Institute of Chemical Engineers

345 E. 47 Street

New York City

New York

10017

Local Availability- Eng.

Corporate Author- Battelle Pacific Northwest Labs.

Richland , Washington , USA

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (10) /

Table

Ref.

Descriptor(s)- / Binary cycle power generation / Binary fluid systems / Comparative evaluations / Computer calculations / Cost / Design / Economics / Geothermal power plants / Geothermal systems / Models / Optimization / Performance / Working fluids /

Abstract by Author

The analytical model called GEOCOST has been constructed and used to study the design, performance and cost of geothermal power plants using the binary fluid cycle. The GEOCOST computer program simulates all the major components of a geothermal system and calculates the cost of energy production by equating the present worth of revenues and expenses including investment return over the economic life of the plant and/or reservoir. The characteristics of the binary fluid cycle power plant are determined for a variety of geothermal resources, working fluids, and cycle types. An optimization technique based upon the maximum use of available energy in the geothermal fluid is generated, and results of this optimization technique are compared with computed cost data for a variety of binary power plants

253. GGIS-100374/0/ / /A/ / / / /

Title- Economic Risk of Geothermal Projects

(5. Session: Workshop: Next Generation Geothermal Power Systems)

Author(s)- / Greider , Bob /

Conference- 3rd Annual Geothermal Conference and Workshop Proceedings

Monterrey

California

USA (June 26 , 1979)
 Publisher- Electric Power Research Institute
 Palo Alto, California
 Publication date- October 1979
 Pagination- Page 10 , 7 Pages
 Report/patent- EPRI-WS-79-166
 Local Availability- CES
 Descriptor(s)- / Cost / Economics / Electric power / Elevated temperature / Financial incentives / Geothermal energy / Geothermal fluids / Geothermal power plants / Risk assessment /
 Abstract by GGIS
 This paper discusses the critical economic factors affecting the risk of a geothermal project. Factors which must be considered are reservoir temperature, reservoir production life, field development costs, rate of return on investment, financial incentives, competing sources of energy, power plant design, and electricity pricing structure. Cost comparisons among the various sources of fuel for electric power generation show that geothermal energy systems are the least expensive. Despite this fact, the biggest problem facing geothermal developers is the difficulty of obtaining risk capital.

 254. GGIS-100059/J/ / 3602/A/ / / / /

Title- Economics of Geothermal Development

Author(s)- / Rex , K. W. /

Journal- Ore Bin

Publication date- Vol. 36 , Issue 2 , 1974

Pagination- Page 17 , 8 Pages

Descriptor(s)- / Economics / Market price / Return on investments / Geothermal resources / Geopressed systems / Reserves / Revenues / United States / Maps / Tables / Oregon /

 255. GGIS-100040/J/ / 312/A/ / / / /

Title- Effect of Geologic Structure and Metamorphic Fluids on Seismic Behaviour of the San Andreas Fault System in Central and Northern California

Author(s)- / Irwin , W. P. / Barnes , I. /

Journal- Geology

Publication date- Vol. 3 , Issue 12 , 1975

Pagination- Page 713 , 4 Pages

Auxiliary expression(s)-
 Illus.

Descriptor(s)- / California / Structural geology / Faults / North-Central / San Andreas Fault / Earthquakes / United States / Large / Moderate / Small / Mechanism / Displacements / Metamorphic water / Migration / Fault zones / Metamorphic rocks / Pore pressure / Geopressure / Mesozoic / Franciscan Formation / Strike-slip / Mechanics / Serpentinite / Seismicity / Seismology / Magnitude /

256. GGIS-100533/O/ / /A/ / / / /

Title- Effect of Measured Wellhead Parameters and Well Scaling on the Computed Downhole Conditions in Cerro Prieto Wells

Author(s)- / Goyal , K.P. / Miller , C.W. / Lippmann , M.J. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- 9 Pages

Local Availability- GGIS

Corporate Author- California Univ.

Lawrence Berkeley Lab., Earth Sciences Division
Berkeley , USA

Auxiliary expression(s)-

Illus. / Graph (4) /

Table

Ref.

Descriptor(s)- / Bottom hole pressure / Cerro Prieto Geothermal Field / Computer calculations / Data analysis / Equations / Flow rate / Geothermal fields / Geothermal wells / Hole diameter / Mexico / Physical properties / Productivity / Well characteristics / Well data / Well head pressure / Well head temperature /

Abstract by GGIS

A wellbore model is used to compute bottomhole pressures from the measured wellhead data of Cerro Prieto wells. This study of the evolution of the field due to production discusses the wellbore model and its describing equations, compares the computed and measured pressures and the effect of wellhead parameters on the downhole pressures. A wellbore model with multiple inside diameters and the effect of well scaling on the bottom hole pressures is also studied.

257. GGIS-100999/O/ / /A/ / / / /

Title- Effect of Noncondensable Gases on Geothermal Power Generation

Author(s)- / Hajela , GP / Katz , B /

Conference- 13th Intersociety Energy Conversion Engineering Conference

Pagination- Page 1121 , 8 Pages

Report/patent- SAE--789315

Corporate Author- Rockwell International Corp.
Canoga Park , California , USA

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (8) /

Table

Ref.

Descriptor(s)- / Binary cycle power generation / Cost / Equipment / Flashed steam systems / Geothermal brines / Geothermal power plants / Noncondensable gases / Thermal efficiency /

Abstract by Author

Two geothermal power generation cycles--direct-flash steam and steam binary cycles--are compared, on the basis of total cost of

major equipment, for a power plant of 10-MWe net output, using a brine containing noncondensable (NC) gases. The concentration of the NC gases was varied over a wide range. The effect of the NC gases on the cost and efficiency of both cycles is discussed. Both cycles are optimized with respect to the given parameter, and the cost of major components is estimated. Over the entire range of NC gas concentrations, the direct-flash steam cycle was found to be more economical.

258. GGIS-100196/R/ / /A/ / / / /

Title- Effect of Temperature and Stress on the Absolute Permeability of Sandstones and Limestones

Author(s)- / Aruna , M / Arihara , N. / Ramey , H. J., Jr. /

Conference- American Nuclear Society Topical Meeting on Energy and Mineral Recover Research

Golden

Colorado

USA (April 12 , 1977)

Publication date- 1977

Pagination- Page 541 , 10 Pages

Report/patent- CONF-770440--

Corporate Author- Stanford Univ.

Stanford , California , USA

Descriptor(s)- / Consolidation / Experimental results / Laboratory studies / Limestone / Permeability / Sandstone / Stresses / Temperature effects /

Abstract by TIC

Experiments by Weinbrands (1972) indicated that the absolute permeability to water for consolidated sandstones decreased markedly with an increase in either confining pressure or the system temperature. Recent experiments by Casse (1974) showed that a large decrease in absolute permeability with temperature increase was peculiar to flow of water in the several consolidated sandstones studied. These experiments were repeated in the present study for other sandstones, and no strong effect was observed for flow of gas, mineral oil, or octanol. Under the hypothesis that a temperature level effect was caused by an attraction between water and quartz which increased with temperature increase, experiments were conducted with flow of water in both consolidated and unconsolidated sandstones. A large, reversible reduction in absolute permeability to water with temperature increase was observed, while no temperature level effect was observed for flow of gas or other non-aqueous fluids. Several experiments with flow of water through limestone samples were conducted. No temperature level effect was observed. It appears that temperature level may affect permeability to water in sandstone systems to an important degree. This should have important connotations to thermal oil recovery and geothermal fluid production.

259. GGIS-100533/O/ / /A/ / / / /

Title- Effects of Temperature and Saturation on the Velocity and Attenuation of Seismic Waves in Rocks

Subtitle- Applications to Geothermal Reservoir Evaluation

Author(s)- / Jones, Terry / Murphy, William / Nur, Amos /
Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16, 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 328, 10 Pages

Local Availability- GGIS

Corporate Author- Stanford Univ.

Dept. of Geophysics

CA, USA

Auxiliary expression(s)-

Illus. / Diagram (4) / Figure (1) / Graph (13) /

Ref.

Descriptor(s)- / Data compilation / Exploration methods / Geothermal exploration / Geothermal gradient surveys / Information needs / Physical properties / Porosity / Reservoir description / Reservoir properties / Reservoir temperature / Seismic surveys / Seismic waves / Subsurface temperature / Thermal exploration methods / Wave propagation / Well information systems /

Abstract by GGIS

Experimental work is reviewed illustrating the sensitivity of wave velocities in rocks and the higher sensitivity of seismic attenuation to parameters of interest to geothermal exploration. Examples show how velocity and attenuation may distinguish whether a geothermal system contains water, steam, or both.

260. GGIS-100899/0/ / /A/ / / / /

Title- Electric Utility Companies and Geothermal Power

Author(s)- / Pivrotto, Donna Shirley /

Conference- 11 Intersociety Energy Conversion Engineering Conference

Pagination- Page 843, 7 Pages

Report/patent- SAE--769145

Sponsor- / U.S. Energy Research and Development Administration
NAS 7-100

Sponsor- / National Aeronautics and Space Administration /

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Commercialization / Demonstration programs / Electric power industry / Feasibility studies / Financing / Geopressure resources / Geothermal energy / Investment / Pilot plants / Power plants / Research programs /

Abstract by Author

The electric utility industry is currently the primary potential market for geothermal energy. Engineers concerned with the design of geothermal power plants, electric conversion equipment or exploration and development technology must therefore consider utility industry requirements which may affect such designs. This paper discusses the needs of the electric utility industry, its structure, the forces which influence utility companies and their relationship to geothermal energy.

Considerations necessary to a federal program for geothermal development are presented, and a strategy for federal stimulation of utility investment in geothermal energy is suggested. The needs for demonstration of commercial feasibility of hydrothermal resources and for reservoir engineering technique development are pointed out. Possibilities are discussed for stimulating utility investment through financial incentives, amelioration of institutional barriers, and technological improvements.

261. GGIS-100393/0/ / /A/ / / / /

Title- Electrochemical Corrosion Measurements in Geothermal Brines

Author(s)- / Eliezer , Zwy / Pearsall , Katherine J. / Mecredy , Henry E. / Tjong , S.C. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 2 , June 1980

Pagination- Page 848 , 27 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS

Austin

TX

78712

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

Sponsor- / Houston Lighting and Power Co., TX (USA)

Sponsor- / Gulf States Utilities Co., Beaumont, TX (USA)

Sponsor- / Central Power and Light Co., San Benito, TX (USA) /

Corporate Author- Texas Univ.

Dept. of Mechanical Engineering

Austin , USA

Auxiliary expression(s)-

Illus. / Photo (4) / Graph (14) /

Table

Descriptor(s)- / Corrosion / Corrosion protection / Geothermal brines / Laboratory testing / Pleasant Bayou No. 2 Well / Stainless steels / Materials testing / Texas /

Abstract by Author

Electrochemical corrosion measurements on several types of structural materials were performed in both synthetic and natural brines. It has been found that the uniform corrosion rate is relatively low for all the materials tested (except the low carbon steel). The localized corrosion is very severe for the regular austenitic, martensitic, and ferritic stainless steels as well as for Inconel 600. No localized corrosion was seen on the low carbon 1018 steel. The two alloys identified in the text as 28 and 2205 showed excellent resistance to localized corrosion. The nature of the passivating film formed in brine on alloy 28 was identified by the Auger electron spectroscopy (AES) technique. It has been found, contrary to expectations, that the protective film is depleted of molybdenum and enriched in manganese. The possible effects of these findings on the development of new corrosion-resistant alloys for the geothermal industry are under study.

262. GGIS-100533/O/ / /A/ / / / /

Title- Eliminating the Wellbore Response in Transient Well Test Analysis

Author(s)- / Miller, Constance W. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16, 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 159, 11 Pages

Local Availability- GGIS

Corporate Author- California Univ.

Lawrence Berkeley Lab., Earth Sciences Division
Berkeley, USA

Auxiliary expression(s)-

Illus. / Graph (14) /

Ref.

Descriptor(s)- / Bottom hole pressure / Flow models / Flow rate /
Geothermal reservoirs / Geothermal wells / Graphs / Information
systems / Mathematical methods / Measuring methods / Pressure
measurement / Reservoir pressure / Reservoir properties / Well
analysis / Well head pressure / Well logging / Well testing /

Abstract by GGIS

The possibility of calculating sandface flowrate is shown given wellhead conditions and the downhole pressure transients, but excluding the need of information pertaining to the reservoir itself. Non-uniform pressure changes in the well are considered, and nonisothermal effects on pressure transient data are illustrated.

263. GGIS-100035/J/ / /A/ / / / /

Title- Energy and Momentum Transport Model of the Ouachita Basin and its Possible Impact on Formation of Economic Mineral Deposits

Author(s)- / Sharp, John M., Jr. /

Publication date- Vol. 73, Issue 6, September 1978

Pagination- Page 1057, 12 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Arkansas / Economic geology / Energy transfer /
Faulting / Geopressured zones / Interstitial water / Lateral
faulting / Lead / Mineral deposits / Missouri / Models /
Paleozoic era / Zinc /

Abstract by Unknown

Analysis of energy and momentum transport in the Paleozoic Ouachita basin lends support to the lateral secretion hypothesis for ore mineral deposition. The processes of importance in energy transport and viscous flow are discussed for the one-dimensional model of the Ouachita basin and the governing partial differential equations are presented. A simple two-stage computer model of the Ouachita basin is then used to test the lateral secretion hypothesis. The lead-zinc

mineralization in the northern Arkansas-southeastern Missouri area may have been formed by discrete pulses of hot pore fluid from the Ouachitas which probably originated after faulting of geopressed sections in the late Paleozoic.

264. GGIS-100046/J/ / 24/A/ // //

Title- Energy for Action, Action for Energy
Publisher- Gulf Coast Association Geological Society
Journal- Transactions, Gulf Coast Association of Geologic Societies
Publication date- Vol. 24 , 1974
Pagination- 480 Pages

265. GGIS-100234/J/ / /A/ // //

Title- Energy to Burn?
Subtitle- Mystery Well in the Bayous Ignites a Controversy Over Methane
Author(s)- / Born , Roscoe C. /
Journal- Barrons
Publication date- Vol. 58 , February 13 , 1978
Pagination- Page 4 , 2 Pages
Auxiliary expression(s)-
 Illus. / Photo (2) /
Descriptor(s)- / Blowouts / Commercialization / Economics /
 Geopressed reservoirs / Louisiana / Methane / Well drilling /
Abstract by Energyline
 A drilling project sponsored by the Chevron Corp. discovered a vast reservoir of untapped geopressed methane near Baton Rouge, La. The economics and practicability of extracting this resource for commercial use are examined. Estimates of how much of the gas is recoverable are considered. Opinions from such sources as AGA and the U.S. Dept. of Energy are surveyed. The blowout of the well tapping the methane resource is described. The potentials and commercial applications of geopressed gas resources are argued.

266. GGIS-100523/R/ / /M/ // //

Title- Energy Analysis of Geothermal-Electric Systems
Author(s)- / Herendeen , R. A. / Plant , R. /
Publication date- December 1979
Pagination- 215 Pages
Report/patent- COO-5085-4
Available- NTIS
 (Paper copy)
 (Microfiche)
Local Availability- CES
Sponsor- / Department of Energy, Washington, D.C. (USA)
 ET-78-S-02-5085 /
Corporate Author- Illinois Univ.
 Office of Vice Chancellor for Research

Geopressured Geothermal Bibliography

Urbana , USA

Descriptor(s)- / Electric potential / Energy accounting / Energy resources / Geopressured systems / Hot dry rock systems / Power generation / Resource potential / USA / Vapor dominated systems / Abstract by NTIS

Standard energy analysis was applied to 4 types of geothermal-electric technologies: liquid dominated, hot dry rock, geopressure, and vapor dominated. It was found that all are net energy producers. Expected uncertainties are not large enough to threaten this conclusion. Vapor dominated, the only technology in current commercial use to produce electricity in the US, has the highest energy ratio (13 +- 4). These results for energy ratio are equal to or less than some from other workers. In the case of liquid dominated, environmental control technology has a considerable energy requirement.

267. GGIS-100462/R/ / /M/ / / / /

Title- Energy Conversion and Economics for Geothermal Power Generation at Heber, California, Valles Caldera, New Mexico, and Raft River, Idaho -- Case Studies

Publication date- November 1976

Pagination- 122 Pages

Report/patent- EPRI ER-301

Available- Electric Power Research Institute

3412 Hillview Avenue

Palo Alto

CA

94304

(Paper copy)

Local Availability- CES

Sponsor- / Electric Power Research Inst., Palo Alto, CA (USA) /

Corporate Author- HOLT/PROCON

Pasadena , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (11) / Figure (4) / Graph (4) / Table

Descriptor(s)- / Binary fluid systems / Case histories / Demonstration plants / Economic analysis / Environmental impacts / Feasibility studies / Flashed steam systems / Geothermal energy conversion / Heber geothermal field / Hybrid systems / Hydrothermal systems / Performance / Power generation / Raft River KGRA / Reservoir temperature / Site selection / Technology assessment / Valles Caldera Geothermal Field /

Abstract by Author

This report presents a portion of the results from a one-year study sponsored by the Electric Power Research Institute (EPRI) to assess the feasibility of constructing a 25-50 MWe geothermal power plant using low-salinity hydrothermal fluids as the energy source. The overall objective of the project was to assess the technical, geotechnical, environmental and economic feasibility of producing electricity from hydrothermal resources like those known to exist in the United States. The objective of this report was to investigate the compatibility of the different power conversion options with real geothermal reservoirs and to analyze the economics of power generation. Three sets of

conversion technology are considered for the near term: flashed steam, binary, and hybrid (flashed steam/binary). Reservoir and geothermal fluid characteristics have a very strong influence on (1) the choice of conversion technology, (2) performance and life of materials and components, (3) necessary environmental controls, and (4) the ultimate cost of generating power. All of these factors are interrelated, and the decision for optimum choice has not yet been developed. This report discusses nine cases which were chosen to yield further insight into the effect of reservoir temperature on the choice of conversion technology and power costs. These cases examine flashed steam, binary cycle and hybrid conversion for Raft River, Idaho; Heber, California; and Valles Caldera, New Mexico that have bottomhole temperatures of approximately 150 deg C, 180 deg C, and 260 deg C respectively. Conceptual layouts of the power conversion processes, cycle analyses and economic analyses are presented. The principal conclusions are: (1) A hydrothermal demonstration plant is technically, environmentally, and economically feasible in the 1980 time frame; (2) the recommended demonstration site is Heber, Imperial Valley, California; (3) binary cycle power conversion technology is recommended; (4) the recommended demonstration plant capacity is approximately 50 MWe; and (5) there are no overriding environmental constraints.

268. GGIS-100335/J/ / /A/ / / / /

Title- Energy Credit for Investments in Business

Author(s)- / Higgins, J. Warren /

Publication date- Vol. 45, Issue 5, September 1979

Pagination- Page 56, 2 Pages

Descriptor(s)- / Investment tax credits / Energy / Tax credits / Equipment / Facilities / Energy conservation / Federal Legislation / Financial incentives / Gas production / Geopressure resources / Geothermal brines / Investment / Natural gas / Taxes /

Abstract by ABI/Inform

The Energy Act of 1978 was designed to reduce the amounts of oil and gas used as a primary source of energy by business and agriculture. The scope of the investment tax credit was enlarged to cover investments in new energy property for agricultural and industrial use; the property must have a useful life of at least 3 years and have been acquired between 9/30/78 and 12/31/82. In calculating the credit, only costs attributable to the taxpayer's basis during the cited period can be included, and an unused portion of the credit may be carried back 3 years and forward 7. The credit can offset 100% of the tax liability; if the credit exceeds that amount, the portion applicable to the wind and solar section are refundable. Any energy property items financed by tax-exempt industrial revenue bonds, partially or wholly, are entitled to only a 5% credit. Energy property falls into 6 categories: 1. alternative energy property, 2. wind or solar energy property, 3. specially defined energy property, 4. shale oil equipment, 5. recycling equipment, and 6. equipment for production of natural gas from geopressured brine.

Geopressured Geothermal Bibliography

269. GGIS-100171/R/ / /M/ / / / /

Title- Energy Information Data Bases

Subtitle- Produced by the DOE Technical Information Center

Pagination- 28 Pages

Report/patent- TID-22783

Available- Technical Information Center

Department of Energy

P.O. BOX 62

Oak Ridge

TN

37830

(Paper copy)

Corporate Author- Department of Energy

Technical Information Center

Oak Ridge , Tennessee , USA

Auxiliary expression(s)-

Table

Descriptor(s)- / Energy / Information retrieval / Information systems

Abstract by GGIS

The Energy Information Data Base (EDB) which is produced by the DOE Technical Information Center, the scope of its coverage of the various fields of energy research, other TIC-produced files, and the RECON interactive on-line retrieval system are discussed.

270. GGIS-100180/J/ / /A/ / / / /

Title- Energy Problems of the USA with Particular Regard to Geothermal Energy

Author(s)- / Adam , R. /

Journal- Gas, Wasser, Waerme

Publication date- Vol. 31 , Issue 6 , 1977

Pagination- Page 194 , 2 Pages

Language- German

Descriptor(s)- / Energy sources / Geopressured systems / Geothermal resources / Hot water systems / USA / Vapor dominated systems /

Abstract by DOE/RECON

Conventional energy resources in the U. S. are limited, and sources such as solar, wind, and tidal power are in early stages of development and promise only a small contribution to the energy economy. Among the future renewable energy resources geothermal energy appears to be the most easily developable and has the greatest potential for significant production. The major portion of the western U. S. possesses significant hot water and steam reservoirs. The Gulf Coast area contains a geopressured area which, in addition to containing an enormous amount of hot, pressurized water, is the largest known natural gas deposit in the U. S. Hot water sources in the state of Oregon are believed to contain energy equivalent to the Alaskan oil fields. It is believed that geothermal energy could provide as much as 10 percent of the U. S. A.'s energy requirements.

271. GGIS-100233/B/ / /M/ / / / /

Title- Energy Resources and Excavation Technology

Author(s)- / Wang , F. D. / Clark , G. B. /

Conference- 18. Symposium on Rock Mechanics; Rock Mechanics in
Geothermal Development
Colorado
USA

Keystone (June 22 , 1977)

Publisher- Colorado School of Mines
Golden, CO

Publication date- 1977

Note- see CONF-770628--P1

272. GGIS-100038/J/ / 8703/A/ / / / /

Title- Energy Transport in Thick Sequences of Compacting Sediment

Author(s)- / Sharp , J. M., JR. / Domenico , P. A. /

Publisher- Geological Society of America

Journal- Geological Society of America Bulletin

Publication date- Vol. 87 , Issue 3 , 1976

Pagination- Page 390 , 11 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Gulf of Mexico / Oceanography / Sedimentation /
Marine geology / Regional / Geopressure / Compaction / Energy /
Models / Theoretical studies / Evolution / Cretaceous / Cenozoic
Era / Pore pressure / Temperature / Hydraulic conductivity /
Thermal conductivity / Diagenesis / Metamorphism / Low-grade /

273. GGIS-100271/R/ / /M/ / / / /

Title- Engineering Study of Water Reinjection for Geothermal Systems

Author(s)- / Jorda , R.M. /

Publication date- January 1978

Pagination- 107 Pages

Report/patent- SAND-78-7009

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Corporate Author- Completion Technology Co.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (31) /

Descriptor(s)- / Artificial recharge / Filtration / Geopressured
reservoirs / Geopressured wells / Geothermal fluids / Gulf Coast
/ Injection wells / Performance testing / Pitting corrosion /
Sealing / Solids / Geopressured systems / Geothermal wells /
Bubbles / Diagrams / Equations / Flow rate / Fluid flow / Oxygen
/ Tables / Trace amounts / Tubes / Water /

Abstract by TIC

Information related to the effects of suspended solids and, to some extent, vapor bubbles on injection well performance is presented. The means of evaluating the tolerable amounts of solids in injected water are presented, and all necessary derivations, equations, test procedures and correlations are explicitly described. Methods of determining whether surface filtration of solids, deep bed filtration of solids, or solids pass-through occurs in the well, and two sets of correlation parameters are presented. An injection well typical of those expected in Gulf Coast geopressured energy recovery systems is described, and optimum injection tubing sizes are calculated. It is concluded that the predominant sources of suspended solids in a system not containing atmospheric, uncovered ponds will be corrosion products and scale particles. Trace oxygen causes a devastating type of pitting corrosion. A technique is used to simulate injection well performance and provides data which illustrate the danger of injecting waters which contain finely divided, flocced solids, and demonstrates that injection problems caused by rigid particulates in the low micron range will be minimal if the process system is designed to produce and handle treated injection water containing specified limits of particulate content, size, and texture. The effects of well damage over a wide range of conditions are presented in a graph which demonstrates that continuous invasion of the reservoir by trappable particulates should be avoided.

274. GGIS-100528/0/ / /A/ / / / /

Title- Enhanced Gas Recovery from a Moderately Strong Water Drive Reservoir

Author(s)- / Chesney , T.P. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 267 , 6 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (6) / Graph (2) / Map (3) /

Table

Ref.

Descriptor(s)- / Enhanced recovery / Evaluation / Fluid properties / Gas saturation / Geology / Reservoir properties / Texas /

Abstract by GGIS

The evaluation, implementation, and results of enhanced gas recovery from water drive reservoirs operated under accelerated blowdown are discussed, using the North Alazan H21 as an example.

275. GGIS-100995/ / / /A/ / / / /

Title- Enhanced Recovery Reservoir Engineering Aspects of Geothermal Development

Author(s)- / Miller , Richard J. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 457 , 3 Pages
 Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 California
 95616

Local Availability- CES
 Auxiliary expression(s)-
 Ref.

Descriptor(s)- / Energy source development / Enhanced recovery /
 Geothermal resources / Heat / Reservoir engineering / Resource
 assessment /

Abstract by Author

The recovery of heat resources is the primary purpose of geothermal development. The production of primary reservoir fluids however, may recover only a very small percentage of reservoir heat. The adoption of effective enhanced recovery methods will be necessary if efficient use is to be made of existing geothermal resources. This summary paper outlines the reservoir engineering aspects of both primary fluid recovery and enhanced recovery methods.

 276. GGIS-100383/R/ / /M/ / / / /

Title- Environmental and Economic Effects of Subsidence

(Category 4, Project 1)

Subtitle- Final Reports

Author(s)- / Viets , V.F. / Vaughan , C.K. / Harding , R.C. /

Publication date- May 1979

Pagination- 244 Pages

Report/patent- LBL-8615

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA), Div. of
 Geothermal Energy
 W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Berkeley Lab.

Berkeley , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (6) / Graph (2) / Map (27) / Figure (1) /

Table

Ref.

Descriptor(s)- / Arizona / California / Case histories / Communities /
 Compaction / Cost / Earth movements / Economic impact /
 Environmental effects / Galveston County / Geothermal reservoirs
 / Ground subsidence / Harris County / Mexico / Nevada / Research
 programs / Texas / Wairakei geothermal field /

Abstract by Author

The development of geothermal energy sources may result in land deformation, commonly referred to as subsidence, as a result of removal or injection of fluids from or into geothermal reservoirs. Data on the actual damages and economic losses that

Geopressured Geothermal Bibliography

have occurred in subsidence areas were collected, and local responses documented, to more clearly define the subsidence problem. Analysis was limited to nine case study areas which seemed to have the best potential for providing reliable data. The areas selected represent rather extreme cases of subsidence. Information was collected from three groups: (1) scientists and engineers studying the technical aspects of subsidence; (2) economists and others studying the environmental and economic effects of subsidence; and (3) public administrators and industry managers who might have primary data on the costs of subsidence. Data collection methods included: literature review; telephone and personal interviews; a mail-out questionnaire (to foreign countries) and site visits. During the course of the research, direct and indirect effects of subsidence were distinguished. It was found that environmental and economic effects directly caused by primary subsidence phenomena can vary from negligible to severe depending on the nature of the land use present and the severity of the subsidence phenomena. Indirect effects, particularly increased flooding, are frequently more severe than the direct effects. Subsidence phenomena such as tilting, horizontal strain and fissuring of the ground surface appear to be more responsible for damage than the simple vertical subsidence of the ground. While there is a serious lack of reliable data on actual subsidence effects in the area studied, it does appear that it is possible to quantitatively predict many types of subsidence effects using conventional engineering techniques to supplement the data.

277. GGIS-100393/O/ / /A/ / / / /

Title- Environmental Analysis of Geopressured Geothermal Prospect Areas, DeWitt and Colorado Counties, Texas

Author(s)- / Badger , Elizabeth / Reeder , Florette / Gustavson , Thomas C. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 2 , June 1980

Pagination- Page 591 , 244 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS

Austin

TX

78712

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA) Div. of Geothermal Energy

DE-AS05-79ET27127 /

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin , USA

Auxiliary expression(s)-

Illus. / Diagram (5) / Graph (6) / Map (34) /

Table

Ref.

Descriptor(s)- / Agriculture / Areal geology / Climate / Colorado County / Cultural resources / DeWitt County / Ecosystems / Environment / Environmental effects / Faulting / Geopressured zones / Ground subsidence / Ground water / Hydrology / Industry / Land use / Lithology / Plants / Pollution / Regional analysis / Site selection / Soils / Surface water / Texas / Topography / Water pollution / Wild animals /

Abstract by Author

Environmental data including structural geology, substrate lithology, soils, natural hazards, water resources, biological assemblages, cultural resources, meteorological data, and regulatory considerations have been compiled and analyzed for two Wilcox Formation geopressured geothermal prospect areas. The Cuero prospect area in DeWitt County and the Eagle Lake prospect area in Colorado County each comprise approximately 218 km² (85 mi²). Analysis of the environmental data, within the spatial limitations set by subsurface reservoir conditions, has allowed recognition of areas within each prospect area that are most suitable as sites for geopressured geothermal test wells. General environmental concerns that apply to both areas include potential accidental brine spills which could impact water resources and potential subsidence and faulting which could damage man-made structures. The Eagle Lake prospect area includes the town of Eagle Lake and is an area of heavy rice production. Rice requires precisely controlled water depths during irrigation. Thus, either accidental brine spills or subsidence could result in substantial impacts. Furthermore, the northeastern portion of the Eagle Lake area is one of the last remaining habitats of the Attwater prairie chicken. The range of this endangered species includes both riceland in the northeastern portion of the prospect area and the Attwater Prairie Chicken National Wildlife Refuge. The western limit of the Eagle Lake prospect includes Eagle Lake, which supports a large population of the endangered American alligator. In the Cuero prospect area there are a few areas of valuable land uses or biological resources.

278. GGIS-100316/R/ / /M/ / / / /

Title- Environmental Analysis of Geopressured-Geothermal Prospect Areas, Brazoria and Kenedy Counties, Texas.

Author(s)- / White, William A. / McGraw, Maryann / Gustavson, Thomas C. /

Publication date- 1978

Pagination- 203 Pages

Report/patent- ORO-5401-T2

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

EG-77-S-05-5401 /

Corporate Author- Texas Univ., Austin

Bureau of Economic Geology

Austin, Texas, USA

Auxiliary expression(s)-

Geopressured Geothermal Bibliography

Illus. / Figure (33) /
Table
Ref.

Descriptor(s)- / Biological effects / Brazoria County / Environmental effects / Fault activation / Geopressured zones / Ground subsidence / Gulf Coast / Lithology / Meteorology / Site selection / Soils / Texas / Water resources / Regulations /

Abstract by Author

Preliminary environmental data, including current land use, substrate lithology, soils, natural hazards, water resources, biological assemblages, meteorological data, and regulatory considerations have been collected and analyzed for approximately 150 KM**2 of land: (1) near Chocolate Bayou, Brazoria County, Texas, where a geopressured geothermal test well is being drilled in 1978, and (2) near the rural community of Armstrong, Kenedy County, Texas, where future geopressured-geothermal test well development may occur. The study was designed to establish an environmental data base and to determine, within spatial constraints set by subsurface reservoir conditions, environmentally suitable sites for geopressured-geothermal wells. In Brazoria County, preliminary analyses of data revealed the need for focusing on the following areas: potential for subsidence and fault activation; susceptibility of test well and support facilities to fresh- and salt-water flooding; possible effects of produced saline waters on biological assemblages and ground-water resources; distribution of expansive soils; and effect of drilling and associated support activities on known archeological-cultural resources. The Kenedy County geopressured-geothermal prospect area is not as promising as the Brazoria County Prospect in terms of known and suspected reservoir characteristics. Environmental problems associated with geopressured-geothermal resource development in this relatively unpopulated South Texas area, however, will be fewer than those in the Chocolate Bayou area.

279. GGIS-100149/R/ / /M/ / / / /

Title- Environmental Assessment of Geopressured Waters and their Projected Uses

Subtitle- Final Report

Author(s)- / Wilson , J. S. / Hamilton , J. R. / Manning , J. A. / Muehlberg , P. E. /

Publication date- April 1977

Pagination- 99 Pages

Report/patent- PB-268289

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES MF

Corporate Author- Dow Chemical Co.

Freeport , Texas , USA

Descriptor(s)- / Artificial recharge / Economics / Environmental effects / Geopressure resources / Geopressured systems / Ground subsidence / Gulf Coast / Louisiana / Power generation / Texas / Uses / Waste water disposal / Environmental impacts / Reinjection /

Abstract by DOE/RECON

A possible source of alternate energy for the nation is believed to exist in the deep geopressed reservoirs found in the Texas and Louisiana Gulf Coast sedimentary basins. This report considers the potential uses of the geopressed geothermal resource and the environmental aspects of those uses. Economics of power production are estimated as an aid to assignment of priority research and development in the area. Principal environmental impacts of any of the proposed uses will result from the waste fluid streams and from possible subsidence of the wellfield. In most instances, disposal of this large volume of saline fluid will require reinjection, canaling to a saline water body, or some more imaginative method. The area is one of natural subsidence which may be accelerated by deep fluid withdrawal. This report describes the resource, the possible uses, the projected resulting emissions, other impacts upon the land, the present stage of development, and projections of future developmental plans.

280. GGIS-100576/R/ / /M/ / / / /

Title- Environmental Assessment of Geopressed Waters and Their Projected Uses

Author(s)- / Wilson , J.S. / Hamilton , J.R. / Manning , J.A. / Muehlberg , P.E. /

Publication date- 1977

Pagination- 85 Pages

Report/patent- EDA-600/7-77-039

Available- NTIS

Corporate Author- DOW Chemical Co.

Freeport , TX , USA

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Aquifers / Environmental geology / Exploitation / Geopressure resources / Uses / Water resources /

281. GGIS-100361/R/ / /M/ / / / /

Title- Environmental Assessment: Geothermal Energy Geopressure Subprogram

Subtitle- DOE Sweet Lake No. 1, Cameron Parish, Louisiana

Publication date- February 1980

Pagination- 245 Pages

Report/patent- DOE/EA-0065

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Corporate Author- U. S. Department of Energy

Assistant Secretary for Resource Assessment

Auxiliary expression(s)-

Illus. / Figure (26) /

Table

Ref.

Geopressured Geothermal Bibliography

Descriptor(s)- / Blowouts / Cameron Parish / Disposal wells /
Environmental effects / Flow rate / Gas saturation / Geology /
Drilling / Geopressured wells / Ground subsidence / Hydrology /
Louisiana / Reservoir temperature / Site selection / Test
facilities / Water chemistry /

Abstract by Author

This Environmental Assessment (EA) has been prepared to assess the environmental implications of the Department of Energy's (DOE's) proposal to drill, complete, and test one geopressure well located in Cameron Parish on a 2 ha (5 ac) test site, 23 km (14 mi) southwest of Lake Charles, Louisiana. The test well is herein referred to as DOE Sweet Lake No. 1. One or more disposal wells will be located within .8 km (.50 mi) of the proposed well. DOE and the State of Louisiana through the State University system proposes to operate the test facility for 26 months to evaluate the geopressure potential of the subsurface. Tests to be conducted include flow rates, fluid compositions, temperature, gas content, geological characteristics, and the land subsidence potential for subsequent production. This EA evaluates the impacts of the proposed action on the area.

282. GGIS-100407/0/ / /A/ / / / /

Title- Environmental Attitudes and Public Concerns Regarding Large-Scale Geothermal Development

Subtitle- The Coso Geothermal Area As Case Study

Author(s)- / Julian , R. Keith / Hall , Louise W. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 679 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasek W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Sponsor- / Bureau of Land Management, Washington, D.C. (USA)

YA-512-CT8-216 /

Auxiliary expression(s)-

Illus. / Map (1) /

Ref.

Descriptor(s)- / California / Coso Hot Springs KGRA / Development /
Environmental impact statements / Environmental impacts /
Exploitation / Geothermal exploration / Geothermal fields /
Leasing / Planning / Public lands / Public opinion / Public
relations / Regional analysis / Socio-economic factors /

Abstract by GGIS

In some ways the Coso, California area public is typical of that of the American West, and in other ways it is unique. In that it is typical, its attitudes and concerns about geothermal development might be representative of other western American communities. The Coso area population comprises two groups: Anglo-Americans and Native Americans; and their prevailing attitudes with respect to geothermal development are in sharp contrast. The Anglo-Americans expressed concern for the long term effect on the local human environment; their concerns were so general that they might characterize any large development project. In contrast, the Native Americans voiced concerns specific to geothermal development. Over the course of the project attention to the public's concerns caused the Anglo-American population to revise its attitude so as to be generally positive. However, the Native Americans could not be convinced of viewing the project with anything more than an attitude of resignation.

283. GGIS-100496/R/ / /M/ / / / /

Title- Environmental Baseline Monitoring in the Area of General Crude Oil - Department of Energy Pleasant Bayou Number 1 - a Geopressured-Geothermal Test Well, 1978
(Annual Report)

Subtitle- Volume IV. Appendix III. Noise Survey, Radian Corporation, Austin, Texas

Author(s)- / Gustavson , T. C. /

Publication date- Vol. 4 , 1979

Pagination- 43 Pages

Report/patent- ORO-5401-T3

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

EG-77-S-05-5401 /

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin , USA

Descriptor(s)- / Acoustic monitoring / Baseline ecology /
Computerized simulation / DOE / Drilling / Geopressured systems
/ Geothermal wells / Noise / Noise pollution / Pleasant Bayou No.
1 Well / Texas /

Abstract by NTIS

Results are presented of a study to determine the acoustical noise distribution and impacts of the geothermal/geopressure well drilling operation near Chocolate Bayou in South Texas. Detailed noise survey data were included in a part of the study for computer simulations to develop representative and worst-case drilling operation noise predictions. Also conducted were baseline noise measurements throughout the Peterson Landing residential area.

Geopressured Geothermal Bibliography

284. GGIS-100498/R/ / /M/ / / / /

Title- Environmental Baseline Monitoring in the Area of General Crude Oil - Department of Energy Pleasant Bayou Number 1 - a Geopressured-Geothermal Test Well, 1978
(Annual Report)

Subtitle- Volume I. Introduction and Technical Report

Author(s)- / Gustavson , T. C. /

Publication date- Vol. 1 , 1979

Pagination- 39 Pages

Report/patent- ORO-5401-T3

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

EG-77-S-05-5401 /

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin , USA

Descriptor(s)- / Air quality / Baseline ecology / DOE / Environmental effects / Geopressured systems / Geothermal wells / Ground subsidence / Microseisms / Monitoring / Noise / Noise pollution / Pleasant Bayou No. 1 Well / Seismic surveys / Texas / Water quality /

Abstract by NTIS

A description of baseline air and water quality of the test site, a noise survey, an inventory of microseismic activity including interpretations of the origin of the events, and a discussion of progress in the installation of a liquid tilt meter at the test well site are presented. In addition, the first-order leveling survey recently completed by the National Geodetic Survey is briefly discussed.

285. GGIS-100497/R/ / /M/ / / / /

Title- Environmental Baseline Monitoring in the Area of General Crude Oil - Department of Energy Pleasant Bayou Number 1 - a Geopressured-Geothermal Test Well, 1978
(Annual Report)

Subtitle- Volume II. Appendix I. Microseismic Monitoring, Teledyne Geotech, Garland, Texas

Author(s)- / Gustavson , T. C. /

Publication date- Vol. 2 , 1979

Pagination- 73 Pages

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA)

EG-77-S-05-5401 /

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin , USA

Descriptor(s)- / Brazoria County / Data / Geopressured wells /
 Microseisms / Monitoring / Seismic events / Seismicity / Texas /
 Abstract by NTIS

This is an interim report on a project to monitor microseismic activity in the vicinity of a future geopressured well test site in Brazoria County, Texas. The data collected to date indicate that numerous weak seismic sources are intermittently active in the vicinity of the test site. However, all of these sources appear to be related to cultural or industrial activity of undetermined origin. At the present time there is no evidence for naturally occurring seismic activity within 4 kilometers of the future test site with local magnitudes in excess of 0.25.

 286. GGIS-100411/0/ / 1/A/ // //

Title- Environmental Considerations and Economic Implications in the Development of Geothermal Energy

Author(s)- / Moseley, Frank N. /
 Conference- 2nd Geopressured Geothermal Energy Conference
 Austin
 Texas
 USA

Publication date- Vol. 1, Issue 1, 1975

Pagination- Page 321, 5 Pages

Available- Center for Energy Studies)

Available- NTIS
 (Paper copy)
 (Microform)

Auxiliary expression(s)-
 Discuss.

Descriptor(s)- / Economics / Environmental effects / Geopressured systems / Geothermal energy / Ground subsidence / Management / Quality / Geo brine / Energy-economic-environment triangle / Water pollution / Proceedings / Environmental geology / Concepts / Control / Geopressure / Resources / Effects / Energy source development / United States /

Abstract by Energyline

The development of geopressured areas for electrical generation and other uses presents an opportunity to employ data management in the decision-making process. A new resource and its development must be economically competitive with existing resources and processes. The initial phase of geothermal exploration, well drilling, and testing is the best time to consider environmental changes that might result from development of the resource. Various options for handling potential changes must be determined so that management plans may be revised. Probably the most serious item of environmental concern about geopressured areas involves water used to produce the energy. Another potential critical problem is subsidence caused by removal of large quantities of water from deep subterranean reservoirs. Discussion is included.

Abstract by ERDA/RECON

The role of economics in determining the feasibility of developing a new resource from both a technological and environmental viewpoint is illustrated. It is pointed out that

general environmental guidelines should be developed during the research phase of geopressured geothermal development. It is suggested that during the initial phase of geothermal exploration, consideration should be given to environmental problems that may be associated with the development, choices available in working with these problems, techniques that could be employed, and environmental responses to the various alternatives. (LS)

287. GGIS-100224/B/ / /A/ / / / /

Title- Environmental Considerations. Geothermal Resources of the Texas Gulf Coast

(In- Geology of Alternate Energy Resources in the South-Central United States)

Subtitle- Environmental Concerns Arising from the Production and Disposal of Geothermal Waters

Author(s)- / Gustavson , T. C. / Kreitler , C. W. /

Publisher- Houston Geological Society

Houston, Texas

Publication date- 1977

Pagination- Page 297 , 39 Pages

Available- Geothermal Information Services

318 Cherrywood St.

West Covina

CA

91791)

Descriptor(s)- / Compaction / Environmental effects / Faulting / Geothermal fluids / Ground subsidence / Gulf Coast / Saline aquifers / Storage / Texas / Waste disposal / Waste storage / Waste water / Water production /

Abstract by TIC

Disposal and temporary surface storage of spent geothermal fluids and surface subsidence and faulting are the major environmental problems that could arise from geopressured geothermal water production. Geopressured geothermal fluids are moderately to highly saline (8,000 to 72,000 parts per million total dissolved solids) and may contain significant amounts of boron (19 to 42 parts per million). Disposal of hot saline geothermal water in subsurface saline aquifers will present the least hazard to the environment. It is not known, however, whether the disposal of as much as 310,000 barrels (54,000 cubic meters) of spent fluids per day into saline aquifers at the production site is technically or economically feasible. If saline aquifers adequate for fluid disposal cannot be found, geothermal fluids may have to be disposed of by open watercourses, canals, pipelines to coastal bays on the Gulf of Mexico. Overland flow or temporary storage of geothermal fluids may cause negative environmental impacts. As the result of production of large volumes of geothermal fluid, reservoir declines may cause compaction of sediments within and adjacent to the reservoir. The amount of compaction depends on pressure decline, reservoir thickness, and reservoir compressibility.

288. GGIS-100336/R/ / /M/ / / / /

Title- Environmental Development Plan (EDP)

Subtitle- Enhanced Gas Recovery, FY 1977

Publication date- March 1978

Pagination- 104 Pages

Report/patent- DOE/EDP-23

Available- NTIS

(Paper Copy)

(Microfiche)

Corporate Author- U.S. Department of Energy

Washington , D.C. , USA

Descriptor(s)- / Aquifers / Enhanced recovery / Gas production /
Geopressured systems / Methane / Pollution control / Research
programs / Socio-economic factors / Environmental policy /
Legislation / Technology assessment /

Abstract by NTIS

This enhanced gas recovery EDP addresses the environmental impacts of enhanced gas recovery processes in shale and sandstone, methane drainage from coalbeds, and methane recovery from geopressured aquifers. The EDP addresses planning in two basic areas: environmental research and environmental assessment. Environmental research can be categorized as follows: characterization of pollutants from EGR processes; selective application of monitoring and measuring techniques; evaluation of control/ mitigation techniques; and evaluation of the synergistic impacts of the development of EGR techniques. Environmental assessment activities scheduled by EDP include: assessment of ecological impacts; assessment of socioeconomic effects; EIA/EIS preparation; evaluation of control technology needs; and analysis of applicable and proposed emission, effluent, and health and safety standards. The EGR EDP includes a technology overview (Section 2), a discussion of EGR environmental issues and requirements (Section 3), an environmental action plan (Section 4), an environmental management strategy for the EGR program (Section 5), and supporting appendices which present information on Federal legislation applicable to EGR technology, a summary of ongoing and completed research, and future research and assessment projects.

289. GGIS-100319/R/ / /M/ / / / /

Title- Environmental Development Plan for Geothermal Energy Systems

Publication date- August 1979

Pagination- 71 Pages

Report/patent- DOE/EDP--0036

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Corporate Author- U.S. Department of Energy

Office of Energy Technology

Washington , D.C. , USA

Geopressured Geothermal Bibliography

Auxiliary expression(s)-

Illus. / Figure (10) /

Table

Ref.

Descriptor(s)- / Air pollution / Environmental effects / Geopressured systems / Geopressured zones / Geothermal systems / Ground subsidence / Hot dry rock systems / Hydrothermal systems / Seismicity / Socio-economic factors / Water pollution /

Abstract by Author

Three types of geothermal resources are covered in this Environmental Development Plan: hydrothermal convection systems, geopressured systems, and hot dry rock systems. Of these three, only hydrothermal convection systems are considered ready for commercial development, and an Environmental Readiness Document for these systems has been published. The other two systems show promise of future development, but current research is now oriented toward resource exploration and confirmation and toward small-scale experiments of heat extraction systems. The geopressured resource is projected to contain large amounts of dissolved methane. The recovery of this methane is part of the geothermal geopressured program. In terms of immediate need and importance in getting power online, the emission of H(sub 2)S is the most important concern and the demonstration of an effective abatement system is the most significant requirement. Demonstration of one such system is targeted for FY 1979 at The Geysers geothermal area. Other significant concerns are the management or disposal of spent geothermal fluids, the potential of land subsidence, questions of water availability for heat rejection systems, land use conflicts, and socioeconomic and cultural problems. The requirements to appropriately research and mitigate these and other concerns in time to permit orderly and timely development of geothermal energy systems are scheduled in this EDP.

290. GGIS-100407/O/ / /A/ / / / /

Title- Environmental Impact of Geothermal Power Development and Utilization

Author(s)- / Bond , Marc A. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 665 , 2 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasek W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Air pollution / Development / Environmental effects / Environmental impact statements / Exploitation / Geothermal resources / Ground subsidence / Land pollution / Power generation / Resource development / Seismic effects / Seismicity / Thermal pollution / Uses / Water pollution /

Abstract by GGIS

Geothermal resource development and utilization cause significant changes in the environment. The environmental impact(s) will be one or more of these several possibilities: air pollution; thermal pollution; surface and groundwater pollution; soil erosion; land subsidence; increased seismicity; or change in existing land uses. In each phase of geothermal activity, be it exploration, development or utilization, specific environmental impacts will demand attention; in general the development phase will be the most costly to the environment.

291. GGIS-100393/O/ / /A/ / / / /

Title- Environmental Issues of Geopressed Resource Development in Louisiana: Integrating Different Goals and Viewpoints

Author(s)- / Newchurch , Edwin J. / Bachman , Ann L. / Bryan , Charles F. / Harrison , Douglas P. / Muller , Robert A. / Wilcox , Ronald E. /

Publisher- 4th Geopressed Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1414 , 23 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Corporate Author- Louisiana State Univ.

Baton Rouge , USA

Auxiliary expression(s)-

Illus. / Map (1) /

Table

Ref.

Descriptor(s)- / Accidents / Air pollution / Energy source development / Environmental impacts / Exploitation / Geopressure resources / Ground subsidence / Hurricanes / Industry / Legal aspects / Liquid wastes / Louisiana / Noise pollution / Regulations / Seismicity / Waste disposal /

Abstract by Author

This paper describes an assessment of the key environmental issues of geopressed resource development in south Louisiana. Priorities were assigned on the basis of seven criteria, the application of which reflects the differing goals and viewpoints of regulatory agencies and industry. Underlying the entire assessment is the particular attention paid to two factors: (1) the large scale of geopressure operations which is the characteristic unique to geopressed operations which is the

Geopressured Geothermal Bibliography

characteristic usual oil and gas field experience; and (2) the regulatory and legal framework of environmental issues. The application of the first factor represents the goal for preserving environmental quality; the second, industry's point of view. Environmental issues are assigned as follows: (1) high priority--subsidence, fluid disposal, and surface disruption in wetland areas; (2) medium priority-- accidental spills; and (3) low priority--air quality and noise impacts, induced seismicity and fault activation, and natural hazards.

292. GGIS-100572/R/ / /M/ / / / /

Title- Environmental Overview of Geopressured-Geothermal Development

Subtitle- Texas Gulf Coast

Author(s)- / Gustavson , T.C. / Kreitler , T.C. /

Publication date- 1979

Pagination- 192 Pages

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-48 /

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin , USA

Descriptor(s)- / Cost / Environmental effects / Environmental impacts
/ Field studies / Gulf Coast / Texas /

Abstract by NTIS

In the summary of the recommended environmental program are: site specific studies; general studies, cost estimates for the program, socioeconomic and demographic research, potential environmental concerns, environmental research, effects of geopressure exploitation, and research plans. The socioeconomic and cultural considerations are impacts on communities. Waste disposal, geologic framework, ground subsidence, and monitoring techniques are discussed.

293. GGIS-100241/O/ / /A/ / / / /

Title- Environmental Overview of Geothermal Resources Development

Author(s)- / Tarlock , A. D. / Waller , R. L. /

Conference- Geothermal Resources Development Institute Conference

Salt Lake City

Utah

USA (January 27 , 1977)

Publisher- Rocky Mountain Mineral Law Foundation

Boulder, CO

Publication date- January 27 , 1977

Pagination- 12 Pages

Report/patent- CONF-770135--

Descriptor(s)- / Air pollution / Energy source development /
Environmental effects / Exploitation / Geothermal energy
conversion / Geothermal resources / Land use / Noise pollution /
Regulations / Water pollution /

Abstract by TIC

Geothermal exploration can be divided into exploration test drilling, production testing, field development, and power generation stages. The major expected physically adverse environmental impacts that can be expected during each of these five major stages are discussed. Next, the regulations applicable to each of the four potential conflicts (land use, water, air, and noise) are surveyed. (MHR)

294. GGIS-100411/0/ / 1/A/ // //

Title- Environmental Problems Associated with Power Production from Geopressured Reservoirs

Author(s)- / Herrin , Eugene / Goforth , Tom /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 311 , 8 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Auxiliary expression(s)-

Illus. / Map (4) /

Discuss.

Descriptor(s)- / Earthquakes / Environmental effects / Fluid withdrawal / Geopressured systems / Ground subsidence / Tectonics / Texas / Geothermal energy / Geo brine / Environmental impact assessment / Land subsidence / Seismology / Louisiana / Proceedings / Environmental geology / Surveys / Southeast / Cameron County / Effects / Exploration / Geopressure / Subsidence / United States / Gulf Coast /

Abstract by ERDA/RECON

Various environmental problems that may arise in the exploration for and exploitation of geopressured reservoirs are considered. A particular reservoir in Northwest Cameron County, Texas, is used as a model. Subsidence effects, tectonic activity, and induced activity are discussed. It is concluded that two important environmental problems cannot be adequately evaluated at this time: surface subsidence and the possible inducement of earthquakes, which could result from the efficient production of power over the lifetime of the reservoir. (LS)

295. GGIS-100308/0/ / /A/ // //

Title- Environmental Response to Non-Electric Geothermal Energy: An Attitudinal Assessment

Author(s)- / Beauchamp , Ellen L. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Geopressured Geothermal Bibliography

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2, Issue 1, 1978

Pagination- Page 39, 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / California / Energy source development /
Environmental effects / Geothermal resources / Public opinion /
Uses /

Abstract by Author

In the assessment of potential environmental impacts of technological change, it is increasingly important to assess public attitude about such change. Typically, public attitude surveys use questions directed toward a specific issue. As part of the engineering and economic assessment of potential utilization of geothermal energy for non-electric applications in the City of Desert Hot Springs, California, an attempt was made to assess basic attitudes and values toward the environment as an indication of community acceptance of increased use of the resource. This was accomplished using the Environmental Response Inventory (ERI), an attitudinal assessment survey. The results indicated that both city officials and the general public fundamentally endorsed technological development. This paper presents the results of the ERI in the City of Desert Hot Springs, and assesses the implications of its use in evaluating implementation of energy technology.

296. GGIS-100528/O/ / /A/ / / / /

Title- Equipment for Testing Geothermal-Geopressured Reservoirs

Author(s)- / Rodgers, John A. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 89, 2 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

SC-PB-80374 /

Auxiliary expression(s)-

Illus. / Diagram (1) /

Descriptor(s)- / Equipment / Geopressured reservoirs / Gulf Coast /
Pleasant Bayou No. 2 Well / Texas / Well testing /

Abstract by Author

The surface facilities for testing geothermal geopressured wells are identical to those for testing a commercial hydrocarbon well with minor modifications. These modifications are necessary to accommodate a high temperature liquid that tends to be corrosive and to deposit scale when pressure is

reduced. Using these modifications, Pleasant Bayou No. 2 was tested with a minimum of trouble.

297. GGIS-100423/R/ / /M/ / / / /

Title- Establishment of Viscometer Capability for Geopressed Fluids
(For the Period November 19, 1978 to December 31, 1979)

Subtitle- Project 61024 Final Report

Author(s)- / Rockar , Evelyn / Randolph , Philip /

Publication date- October 1980

Pagination- 25 Pages

Report/patent- DOE/ET/27086-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-78ET27086 /

Corporate Author- Institute of Gas Technology

Chicago , IL , USA

Auxiliary expression(s)-

Illus. / Diagram (1) /

Ref.

Descriptor(s)- / Calibration / Capillary flow / Corrosion / Cost /
Feasibility studies / Geothermal brines / Geothermal fluids /
Laboratory testing / Measuring instruments / Methane /
Recommendations / Specifications / Technology assessment /
Technology utilization / Viscosity /

Abstract by TIC

The feasibility of modifying the IGT capillary viscometer for the measurement of methane-saturated brines at 10,000 psi and 200 exp 0 C was evaluated. The viscometer was cleaned, modified, reassembled and pressure treated. The density cells were calibrated to a precision of approximately 7%. The viscosity of pure value was measured and the best value obtained was 6% below values reported in the literature. The operation of the viscometer was time consuming and required meticulous cleaning between experiments. Some corrosion at the mercury surface interfered with the efficient operation of the timing device. Other problems were encountered due to gas bubbles trapped in the capillary flow path. Consequently, data on methane-saturated brine could not be obtained within the funding limitations of this program. It is concluded that further work on the existing viscometer would not be cost effective.

298. GGIS-100054/J/ / /A/ / / / /

Title- Estimation of Aquifer Permeabilities from Electric Well Logs

Author(s)- / Obbe , David / Bassiouni , Zaki /

Publication date- Vol. 19 , Issue 5 , September 1978

Pagination- Page 21 , 7 Pages

Corporate Author- Louisiana State Univ., Baton Rouge

Baton Rouge , Louisiana , USA

Auxiliary expression(s)-

Geopressured Geothermal Bibliography

Ref.

Descriptor(s)- / Aquifers / Electrical logging / Geopressure resources / Permeability / Resistivity surveys / Well data /

Abstract by Compendex

Evidence from core data and log studies shows that permeability is related to formation resistivity factor. Empirical correlation relating the two rock parameters is determined using core data. Knowing the formation resistivity factor from electric logs, it is possible to calculate the permeability of a given formation interval. Field examples show that the proposed method is applicable in both water bearing and hydrocarbon bearing zones. The ability to predict the permeability of water bearing zones from electric well logs is of great importance in the assessment of aquifers' geopressure energy resource.

299. GGIS-100393/0/ / /A/ / / / /

Title- Estimation of Stress-Sensitive Reservoirs' Initial Parameters by Use of the Conventional Well Test Methods

Author(s)- / Elemo, Rufus O. / Knapp, Roy M. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 2, June 1980

Pagination- Page 960, 12 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS

Austin

TX

78712

(Paper copy)

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (2) / Figure (1) /

Table

Ref.

Descriptor(s)- / Compaction / Evaluation / Geopressured reservoirs / Models / Permeability / Reservoir engineering / Reservoir properties / Simulation / Stresses / Well testing /

Abstract by Author

This paper discusses the results of the study made to estimate the initial values of some pertinent parameters for stress-sensitive reservoirs by using current conventional well test methods. Stress-sensitive reservoirs possess rock and fluid properties that change as the effective stress on the reservoir rock changes. As a result of some of the assumptions made to develop the conventional well test methods, such methods may not be suitable for stress-sensitive reservoir parameter estimation. This study was made to determine the degree of discrepancy that can be expected if the conventional well test methods are applied. A hypothetical, stress-sensitive geopressured-geothermal closed square reservoir flowing a single-phase, slightly compressible fluid was selected for the investigation. The parameter determined is the initial formation permeability. Pressure drawdown, pressure buildup, and multiple flow rate tests were simulated for the purpose of the estimation. A two-dimensional finite difference model of

the reservoir was used. The results obtained by use of these conventional well test methods are poor. Actual data from a geopressured-geothermal reservoir will be required to confirm the validity of the model.

300. GGIS-100079/ / / /M/ / / / /

Title- Eugene Island Block 18 Field

(Paper 8 in Offshore Louisiana Oil and Gas Fields)

Subtitle- Offshore Louisiana

Author(s)- / Robinson , B. Brick /

Pagination- Page 51 , 5 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Louisiana / Oil and gas fields / Economic geology /
United States / Petroleum / Gas / St. Mary Parish / Offshore /
Gulf Coast / Eugene Island Block 18 Field / Production / Data /
Structure / Stratigraphy / Geopressure / Contour maps /
Sandstone / Miocene /

Abstract by GGIS

A description of the Eugene Island Block 18 Field structure and production characteristics is given. The field contains 60 oil wells, 6 gas wells and 22 dry wells; estimated ultimate production of developed reserves is 51mm bbls. of oil and 220bcf of gas. Geopressures are present starting at about 11,000 ft.

301. GGIS-100216/J/ / /A/ / / / /

Title- Evaluating Overpressure in the Twilight Zone

Author(s)- / Aud , B. W. / Fertl , W. H. /

Publication date- Vol. 48 , Issue 6 , 1976

Pagination- Page 122 , 9 Pages

Descriptor(s)- / Reservoir studies / Seismic prospecting /
Continental shelf, offshore / Continental Shelf / Reservoir
description / Seismic detection / Seismic surveys / Geopressure
/

302. GGIS-100280/R/ / /M/ / / / /

Title- Evaluation of an Energy Resource - Geopressured Geothermal Zone, Texas Gulf Coast

Author(s)- / Bebout , Don G. / Loucks , Robert G. / Gregory , A.R. /
Conference- 53rd Technical Conf. and Exhibition of SPE-AIME
Houston
Texas

USA (October 1 , 1978)

Publication date- 1978

Pagination- 8 Pages

Report/patent- SPE-7539

Available- SPE-AIME

6200 N. Central Expy.

Dallas

Geopressured Geothermal Bibliography

TX
75206
(Paper copy)
Local Availability- CES
Corporate Author- Society of Petroleum Engineers (AIME)
Dallas , TX , USA
Auxiliary expression(s)-
Illus. / Diagram (3) / Graph (6) / Map (4) /
Ref.
Descriptor(s)- / Austin Bayou Prospect / Brazoria County /
Exploratory wells / Fairway analysis / Frio Formation /
Geopressured zones / Gulf Coast / Reservoir properties /
Resource assessment / Texas /
Abstract by Author
Regional and detailed geological studies of the Frio, Vicksburg,
and Wilcox Formation along the Texas Gulf Coast have been
conducted in order to delineate areas favorable for the
production of geopressured geothermal energy. These studies
have been completed for the Frio Formation, and several
geothermal fairways have been identified that contain thick
sandstone zones with temperatures higher than 300 DEG F. The
Brazoria Fairway was found to meet best the specifications
believed necessary for a successful test of the resource, and the
Austin Bayou Prospect has been outlined in this fairway. A
geothermal test well is scheduled to be drilled in the Austin
Bayou Prospect, and several geopressured sandstones will be
tested between the depths of 13,500 and 16,500 FT.

303. GGIS-100012/0/ / 1/A/ // //

**Title- Evaluation of the Abnormally High and Low Pressure Morrow
Formation, Oklahoma**

Author(s)- / Helander , Donald P. /
Conference- Southeast Asia Petroleum Exploration Society Proceedings
Publication date- Vol. 1 , 1974
Pagination- Page 92
Descriptor(s)- / Oklahoma / Economic geology / Petroleum / Regional /
United States / Reservoir rocks / Pressure buildup /
Pennsylvanian / Morrow Formation /

304. GGIS-100501/R/ / /M/ // //

**Title- Evaluation of the Geopressured Energy Resource of Louisiana
and Texas**

Author(s)- / Samuels , G. /
Conference- SPE/DOE Symposium On Unconventional Gas Recovery
Pittsburgh
PA (May 18 , 1980)
Publication date- 1980
Pagination- 18 Pages
Report/patent- CONF-800525-4
Available- NTIS
(Paper copy)
(Microfiche)

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-26 /

Corporate Author- Oak Ridge National Lab.

TN, USA

Descriptor(s)- / Economic analysis / Economics / Energy resources /
Evaluation / Forecasting / Geopressure resources / Geopressured
reservoirs / Louisiana / Methane / Natural gas / Profitability /
Production rate / Texas /

Abstract by NTIS

The economics of extracting either the geothermal energy or natural gas from geopressured aquifers does not look promising. The combined requirements of high well flow rates, long life, and the necessity for close well spacing to minimize cost of the collection system may be incompatible with the actual characteristics of the reservoirs. These factors place such stringent requirements on the reservoir size, permeability and compressibility that the number of promising production areas may be severely limited.

305. GGIS-100517/R/ / /M/ // //

Title- Evaluation of Geopressured Brine Injectability

Subtitle- Department of Energy, Pleasant Bayou No. 2 Well, Brazoria County, Texas

Author(s)- / Owen, L. B. / Blair, C. K. / Harrar, J. E. /
Netherton, R. /

Publication date- October 28, 1980

Pagination- 92 Pages

Report/patent- UCID-18860

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Livermore Lab.

Livermore, USA

Descriptor(s)- / Brazoria County / Geothermal brines / Gulf Coast /
Injectability / Injection wells / Pleasant Bayou No. 2 Well /
Recovery processes / Texas /

Abstract by NTIS

A field evaluation of geopressured brine injectability was completed during September 22 to 25, 1980 at the DOE, Brazoria test site in Texas. Membrane filters, with pore sizes of 0.4- μ m and 10.0- μ m, were used as the basis for obtaining suspended solids data and for developing performance-life estimates of typical spent brine injection wells. Field measurements were made at 130 exp 0 C and line pressures up to 3800 psig. Scale inhibited (phosphonate-polyacrylate threshold-type, carbonate scale inhibitor), prefiltered-scale-inhibited, and untreated brine were evaluated. Test results indicated that raw brine was highly injectable, while scale-inhibited brine resulted from partial precipitation of the scale inhibitor.

306. GGIS-100223/J/ / /A/ / / / /

Title- Evaluation of Geopressured Zones

Author(s)- / Barnea , J. /

Journal- Geotherm. Rep.

Publication date- Vol. 6 , Issue 7 , April 1 , 1977

Pagination- Page 1 , 4 Pages

Descriptor(s)- / Geopressured systems / Natural gas fields / Reviews / Texas / Geopressured zones / Gulf Coast / Research programs / Resource assessment /

Abstract by DOE/RECON

A critique of a recently completed, ERDA-sponsored study on methodology for geopressured zones is presented. The study is entitled "Development of an Assessment Methodology for Geopressured Zones of the Upper Gulf Coast Based on a Study of Abnormally Pressured Gas Fields in South Texas, Final Report." Inadequacies of the study are emphasized. (JGB)

307. GGIS-100531/R/ / /M/ / / / /

Title- Evaluation of Geothermal Energy Exploration and Resource Assessment--Final Report

Subtitle- Volume I: A Review of Geothermal Subsidence Modeling

Author(s)- / Grover , M.K. / Lewis , J.G. / Oberste-Lehn , D. / Rawson , G.E. / Srinivasa , D.S. /

Publication date- Vol. 1 , December 1977

Pagination- 284 Pages

Report/patent- SAN/1269-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy
EY-76-C-03-1269 /

Corporate Author- Rand D Associates

Marina del Ray , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (12) / Figure (3) / Graph (19) / Map (5) /

Table

Ref.

Descriptor(s)- / Control / Geothermal exploration / Geothermal reservoirs / Geothermal resources / Ground subsidence / Mathematical models / Monitoring / Reservoir funds / Resource assessment /

Abstract by Author (revised)

The present status of the numerical modeling of subsidence phenomena associated with the production of fluid from geothermal reservoirs is addressed in this report. This evaluation includes a comparative analysis of present numerical modeling codes including an evaluation of their potential for application to specific geologic environments where the subsidence may occur. In addition, preparation guidelines for

subsidence modeling application are provided to assist the program managers responsible for the supervision of subsidence monitoring and control measures associated with geothermal development. Also included are sections on data acquisition and management and a proposed method for qualitatively ranking the subsidence risks of a known geothermal reservoir. The subject of data uncertainties management is introduced and briefly discussed.

308. GGIS-100559/R/ / /M/ / / / /

Title- Evaluation of Potential Geopressure Geothermal Test Sites in Southern Louisiana

Author(s)- / Bassiouni , Z. /

Publication date- April 1980

Pagination- 180 Pages

Report/patent- DOE/ET/28465-T1

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

AS05-76ET28465 /

Corporate Author- Louisiana State Univ.

Dept. of Petroleum Engineering

Descriptor(s)- / Geopressured zones / Louisiana / Planning /
Production / Site selection / Testing /

Abstract by NTIS

Six geopressured-geothermal prospects in southern Louisiana were studied in detail to assess their potential use as test sites for the production of geopressured-geothermal energy. Each of the six sites contains substantial quantities of energy. Three of these prospects, Grand Lake, Lake Theriot, and Bayou Hebert, appear to be suitable for a test site. A summary of the findings is presented.

309. GGIS-100308/O/ / /A/ / / / /

Title- Evaluation of Seals for a Geothermal Logging Tool

Author(s)- / Arnold , Charles, Jr. / Coquat , Joseph A. / Baker , Leonard E. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 17 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Sandia Labs.

Albuquerque , New Mexico , USA

Geopressured Geothermal Bibliography

Auxiliary expression(s)-

Illus. / Diagram (1) / Photo (2) / Graph (1) /

Table

Ref.

Descriptor(s)- / Elastomers / Elevated pressure / Elevated temperature / Geothermal brines / Seals / Well logging /

Abstract by Author

The seal efficiency and environmental resistance of various elastomeric o-rings and a metallic joint that were immersed in geothermal brine of water at elevated temperatures and pressures were determined. A leakproof seal was maintained with a stainless steel Conoseal-joint for 100 hours in water and 24 days in geothermal brine at 275 DEG C and 34.5 MPa (5000 PSI). Only very small quantities of moisture penetrated o-ring seals made from Kalrez, a perfluoroelastomer, ethylene/propylene rubber and a Parylene C coated Viton o-ring. All other rubber seals failed catastrophically.

310. GGIS-100407/0/ / /A/ / / / /

Title- Evaluation of State Taxes and Tax Incentives and Their Impact on the Development of Geothermal Energy in Western States

Author(s)- / Meyer, Richard T. / Bronder, Leonard D. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9, 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4, 1980

Pagination- Page 739, 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Sponsor- / EG and G Idaho, Inc., Idaho Falls (USA)

K-1521

Sponsor- / Department of Energy, Washington, D.C. (USA)

K-1521 /

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Capital / Commercialization / Comparative evaluations / Computerized simulation / Cost / Data / Economic impact / Financial incentives / Geothermal energy / Geothermal industry / Government policies / Investment / Legislation / Local government / Profits / Recommendations / Regional analysis / Taxes /

Abstract by GGIS

Guidelines for improving state tax structures so as to encourage geothermal energy development are presented in this

article. The guidelines are the product of a study of existing tax structures and their impact on such development. Economic models representing four businesses and their use of geothermal energy (low temperature process heat for a greenhouse specializing in wholesale flower growing, space and hot water heating for an apartment complex, process heat for a food processing industry, and small scale electrical power generation and cascaded direct thermal heat for a small industrial park) were placed in the existing tax structures of each of eight states, evaluated, and the effects of net profits and tax revenues determined. Equitable changes in the tax structures may be effected through implementation of these recommendations: investment tax credit; deletion of certain applications of sales tax; deduction of exploration costs as an expense; elimination of severance taxes on geothermal extraction; and reduction of property taxes through exemption of drilling investments.

311. GGIS-100010/0/ / /A/ / / / /

Title- Evaluation of Sulfide Corrosion Cracking Resistance in Low Alloy Steels
(Paper 96)

Conference- International Corrosion Forum
Toronto
Ontario
Canada

Publication date- April 18 , 1975

Pagination- Page 19

Auxiliary expression(s)-
Ref.

Descriptor(s)- / Oil wells / Steel corrosion / Stress corrosion cracking / Steel / Corrosion resistance / Oil field equipment / Tubular goods / Sulfide corrosion cracking /

Abstract by NTIS

An environmental fracture mechanics test is described which had proven useful in evaluating the sulfide corrosion by the oil industry for high strength production tubulars which are required for the new, deep geopressured wells. The test, which quickly and quantitatively evaluates sulfide corrosion cracking resistance, is required both to qualify steel for sour service and to facilitate research into finding more resistant steels.
17 refs.

312. GGIS-100407/0/ / /A/ / / / /

Title- Evidence of Pressure Solution in Geothermal Reservoir Sandstone

Author(s)- / Schatz , J. F. / Wolgemuth , K. M. / Vonder Haar , S. /
Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
Salt Lake City
Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Geopressured Geothermal Bibliography

Davis, CA
Publication date- Vol. 4, 1980
Pagination- Page 377, 4 Pages
Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts
Available- Geothermal Resources Council
P.O. Box 98
Davis
CA
95616
Local Availability- GGIS
Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
Geothermal Energy
W-7405-ENG-48 /
Auxiliary expression(s)-
Illus. / Photo (5) /
Ref.
Descriptor(s)- / California / Compaction / Creep / East Mesa KGRA /
Economics / Elevated pressure / Elevated temperature /
Experimental results / Field studies / Geothermal reservoirs /
Laboratory studies / Measurement / Permeability / Pore pressure
/ Porosity / Reservoir engineering / Sampling / Sandstone /
Abstract by GGIS

As part of the construction of theories of inelastic, time-dependent rock compaction so that models for subsidence prediction over the planned life span of a geothermal reservoir may be developed, one concern is assessing the relative importance of various mechanisms (so the model will be based on the correct mechanism). Possible mechanisms include: plastic flow; pressure solution; growth of microcracks; and slippage along grain boundaries. The particular concern of this presentation are the observations by the scanning electron microscope which provide for the pressure solution mechanism.

313. GGIS-100260/R/ / /M/ / / / /

Title- Executive Summary

Subtitle- 1. Volume
Author(s)- / Kuuskraa, V.A. / Brashear, J.P. / Doscher, T.M. /
Elkins, L.E. /
Publication date- Vol. 1, October 1978
Pagination- 60 Pages
Report/patent- HCP/T2705-01
Available- NTIS
(Paper Copy)
(Microfiche)
Corporate Author- Lewin and Associates, Inc.
Washington, D.C., USA
Auxiliary expression(s)-
Illus. / Figure (14) /
Descriptor(s)- / Aquifers / Cost benefit analysis / Financial
incentives / Gas production / Geopressured systems / Natural gas
deposits / Research programs /
Abstract by TIC
R and D efforts in enhanced gas recovery of near-conventional and
unconventional gas sources are needed in order to augment

domestic supplies. Unconventional gas sources could provide 200 to 220 Tcf of additional gas supply, if a combination of economic incentives and publicly sponsored R and D is used, and as much as 2 to 8 Tcf could be delivered per year by 1990. This volume comprises three parts discussing the public policy issues, proposed research strategy in enhanced gas recovery, and methodology.

314. GGIS-100337/R/ / /M/ / / / /

Title- Existence and Flow Behavior of Gas at Low Saturation in Geopressured Formations

Subtitle- Final Report

Author(s)- / Matthews , C.S. /

Publication date- April 1979

Pagination- 62 Pages

Report/patent- HCP/T2259-05

Available- NTIS

(Paper Copy)

(Microfiche)

Corporate Author- U.S. Department of Energy

Geothermal Energy Div.

Washington , D.C. , USA

Descriptor(s)- / Flow rate / Gas saturation / Geopressured reservoirs / Geopressured wells / Geothermal brines / Methane / Water production / Well logging / Sand /

Abstract by TIC

The first geopressured brine well tested for the Department of Energy produced gas and brine at a ratio far above the solution ratio for the gas in that brine. One explanation advanced was that the geopressured formation contained gas at a low saturation, and that this gas flowed into the well during the test. This hypothesis is examined and found to be untenable based on evidence from well logs, flow tests and thermodynamics, and on currently accepted concepts for migration and accumulation of petroleum. The probable explanation for the observed high gas/water ratios is shown to be a thin, tight gas-bearing layer in the case of one sand and an updip gas cap in the case of the second sand tested

315. GGIS-100067/J/ / 2009/A/ / / / /

Title- Experience and Technological Problems Involved in Boring Through Abnormally Layered Horizons Subjected to Risks of Losses of High Pressure and Flushing

Original Subtitle- Erfahrungen und Technisch-Technologische Probleme Beim Aufschluss Wechselgelagerter Hochdruck- und Spelungsverlustgefaerdeter Horizonte

Author(s)- / Kappler , Werner / Karkossa , Hans / Japp , Dieter /

Journal- Z. Angew. Geol.

Publication date- Vol. 20 , Issue 9 , 1974

Pagination- Page 426 , 9 Pages

Language- German

Auxiliary expression(s)-

Geopressured Geothermal Bibliography

Sum.

Descriptor(s)- / Engineering geology / Well logging / Ground water /
Uses / Surveys / Wells / Pressure buildup / Hydrostatic /
Problems / Penetration / Complications / Paleozoic / Permian /
Rotliegendes / Zechstein / Triassic / Bryven / East / Europe /
Geopressure / Geochemistry /

316. GGIS-100016/0/ / /A/ / / / /

Title- Experience with Perforating Efficiency in Underbalanced
Completions of Geopressured Reservoirs
(Paper SPE 4793)

Conference- Form Damage Control
New Orleans
Louisiana
USA

Publication date- February 8 , 1974

Pagination- Page 253 , 4 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Natural gas wells / Well completion / Oil well casing
/

Abstract by NTIS

Underbalanced perforating has been proposed as a method of improving perforating efficiency in gas wells. However, it has not proven to be an effective means of establishing unimpaired communication with geopressured Vicksburg Gas Reservoirs in South Texas. Lack of effective jet perforating guns in the small-diameter sizes is the probable cause. Average skin factors and delta-P skins of 8.09 and 3352 PSI respectively were determined on ten wells after perforating with an underbalance of 4700 PSI. The results in South Texas emphasize the need for improved through-tubing perforating guns. 7 refs.

317. GGIS-100995/ / / /A/ / / / /

Title- Experiments for Rapid Assessment of the Scaling Properties of
Geothermal Fluids

Author(s)- / Rimstidt , J.D. / Barnes , H.L. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 567 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Sponsor- / U.S. Bureau of Mines

G1055140 /

Corporate Author- Pennsylvania State Univ.

Ore Deposits Research Section

University Park , Pennsylvania , USA

Auxiliary expression(s)-

Illus. / Graph (2) / Diagram (2) /

Descriptor(s)- / Chemical properties / Geothermal fluids / Heat extraction / Kinetic energy / Mineral wastes / Precipitation / Scaling / Scaling control / Thermodynamic properties /

Abstract by Author (rev.)

Too often heat extraction systems are designed with only minimal regard for scale prevention. However, there are some simple thermodynamic and kinetics principles that can be utilized in the basic design of these systems. In addition, it is useful to perform simple field tests on the geothermal fluid to determine its scaling characteristics under conditions similar to those expected in the heat extraction facility. Two simple experimental methods have been designed which can be used at low cost to empirically test scaling behavior prior to the installation of expensive pilot or power plants. These experiments and related kinetic factors are considered here.

318. GGIS-100234/J/ / /A/ // //

Title- Eyes of Texas are Upon the First Test Well Drilling for Geopressured Methane

Author(s)- / Born , Roscoe C. /

Journal- Barrons

Publication date- Vol. 58 , Issue 41 , October 9 , 1978

Pagination- Page 11 , 5 Pages

Descriptor(s)- / Geopressure resources / Geopressured wells / Methane / Test wells / Texas / Well testing /

Abstract by EIC

To skeptical oil and gas people, estimates of enough geopressured methane to last from one to 50 centuries are fanciful. But renewed interest in the energy resource is about to explode. For the U. S. Dept. of Energy, the General Crude Oil Co. is sinking in Texas the first well known to be deliberately aimed at geopressured methane. A degree of mystery surrounds potential in the superheated, superpressured zone where briny waters are saturated with methane. Rep. John Dingell (D-Mich.) and his subcommittee on energy and power are expected to open hearings to consider the energy potential of the unconventional gas source.

319. GGIS-100308/O/ / /A/ // //

Title- EPA Pollution Control Guidance for the Geothermal Industry

Author(s)- / D'Alessio , Gregory J. / Hartley , Robert /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 133 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

Geopressured Geothermal Bibliography

California
95616

Local Availability- CES

Corporate Author- U.S. Environmental Protection Agency
Washington, D.C., USA

Descriptor(s)- / Air pollution / Energy source development /
Environmental effects / Geothermal resources / Noise Pollution /
Pollution regulations / Radioactive wastes / US EPA / Waste
disposal / Water pollution /

Abstract by Author (rev.)

The pollutant control regulatory approach being adopted by EPA is designed to (1) establish point source emission and discharge limitations prior to significant commercialization; (2) provide guidance documents through the development and demonstration phase on limitations that can be anticipated prior to construction; (3) by way of the same periodic guidance, minimize uncertainties in emission and discharge requirements; (4) develop and evaluate information which supports guidance and regulations throughout the precommercialization stage, in concert with the industry and other involved government agencies; and (5) regulate geothermal pollution throughout the precommercialization period by application of the emission and discharge permit systems, which may be State-administered, with permit conditions based upon present ambient standards, known or expected effects, and state-of-the-art technology. Periodic guidance will be issued by EPA with respect to these factors beginning with the initial geothermal pollution guidance document. Guidelines are being established for the control of air pollution, water pollution, waste disposal, noise pollution, and radiological pollutants.

320. GGIS-100042/J/ / /A/ / / / /

Title- EPRI Examines Geopressured Water/Gas as Potential Energy Source

Publication date- Vol. 7, Issue 2, February 1979

Pagination- Page 8, 2 Pages

Descriptor(s)- / Binary cycle power generation / Economics / Electric power / Geopressured zones / Louisiana / Methane / Power potential / Research programs / Technology utilization / Texas /

Abstract by GGIS

Researchers at Southwest Research Institute, San Antonio, Texas, recently started work on a one-year project to determine how existing technology can extract and use geopressured water and gas to produce commercial electric power. Sponsored by the Electric Power Research Institute, the project's aim is to evaluate the economic aspects of the geopressured resource and demonstrate its use in the mid-1980s. Researchers are also investigating ways of strengthening existing equipment for converting pressure into electric energy so that it can tolerate the high pressures, temperatures, and corrosive fluids.

321. GGIS-100217/J/ / /A/ / / / /

Title- ERDA Seeks Proposals to Identify Gulf Coast Geopressured Wells

Journal- Inf. ERDA Wkly. Announce.

Publication date- Vol. 3 , Issue 14 , 1977

Pagination- Page 4

Descriptor(s)- / Exploration management / Geothermal prospecting / Southern Central States / Geopressure exploration / Gulf Coast / Research programs / Geopressured wells /

Abstract by ERDA

ERDA plans to seek proposals to identify and test existing Gulf Coast wells to determine the energy potential of large underground formations containing hot, salty water. These subterranean brines, called geopressured, geothermal reservoirs, are believed to contain significant quantities of dissolved natural gas and could extend along the entire Texas-Louisiana coastline. In addition to identifying appropriate wells, the proposer would be responsible for managing testing programs to determine the technical and economic feasibility of tapping both the natural gas and heat energy. The total program is expected to cost about \$3 million and is planned to be completed in one year.

322. GGIS-100219/J/ / /A/ / / / /

Title- ERDA Seeks Proposals to Identify Gulf Coast Geopressured Wells

Journal- Ground Water News1.

Publication date- Vol. 6 , Issue 8 , 1977

Pagination- Page 3

Descriptor(s)- / Research programs / Geothermal energy / Gulf of Mexico / Coastal areas / Geopressure exploration / Geopressured wells / Gulf Coast /

323. GGIS-100155/J/ / /A/ / / / /

Title- ERDA's Tigre Lagoon Program to Probe New Energy Source

Publication date- Vol. 37 , Issue 4 , February 1976

Pagination- Page 27 , 1 Pages

Descriptor(s)- / Electric potential / Geopressure resources / Geothermal resources / Louisiana / Methane / Tigre Lagoon Geothermal Field / US ERDA / Vermilion Parish /

Abstract by WRA

A new geopressure, geothermal energy research program of the Energy Research and Development Administration is described. The initial project is to explore the Tigre Lagoon area of Vermilion Parish, Louisiana for geopressure and geothermal energy sources to produce electricity. The Tigre Lagoon test will utilize an old Coastal States oil well at a depth between 13,000 and 14,000 feet. The project plans to exploit the three basic energy sources of pressure, temperature, and methane. Such energy sources could last as long as 25 years. The program's long range goal is to save six million barrels of fossil fuel imports per day by 1990.

324. GGIS-100005/O/ / 3/A/ // //

Title- ERDA'S Geothermal R&D Program

Conference- Energy Technology II

Publisher- Govt. Inst., INC.

Washington, D.C.

Publication date- Vol. 3, March 31, 1976

Pagination- Page 115, 14 Pages

Corporate Author- U.S. Energy Research and Development Agency

Auxiliary expression(s)-

Illus. / Diagram (2) / Map (2) / Photo (1) / Table (1) /

Descriptor(s)- / U.S. Energy Research and Development Administration / ERDA / Research programs / Geothermal energy / Hot dry rock systems / Hot water / Geothermal resources / Geothermal wells / Geo brine /

Abstract by Energyline

ERDA'S Geothermal Energy Program aims to: Reduce resource uncertainties and increase reservoir predictability; develop identified hydrothermal resources and help establish an industry base; and help industry develop technology to exploit geopressured and hot dry rock resources. The nation's geothermal resources, which are described, are large enough to warrant an intensive development program. ERDA geothermal development strategies are discussed. (2 diagrams, 2 maps, 1 photo, 1 table)

325. GGIS-100032/J/ / 5203/A/ // //

Title- Factors that Control Subsurface Pressures

Author(s)- / Massengill, G. L. /

Journal- Compass

Publication date- Vol. 52, Issue 3, 1975

Pagination- Page 63, 7 Pages

Descriptor(s)- / Engineering geology / Geopressured reservoirs / Overburden pressure / Pressure buildup / Static / Potential energy / Overburden / Diastrophism / Chemical / Temperature / Petroleum / Geopressure /

326. GGIS-100393/O/ / /A/ // //

Title- Factors Controlling Porosity and Permeability in Geopressured Frio Sandstone Reservoirs, General Crude Oil/Department of Energy Pleasant Bayou Test Wells, Brazoria County, Texas

Author(s)- / Loucks, Robert G. / Richmann, Debra L. / Milliken, Kitty L. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 1, June 1980

Pagination- Page 46, 39 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin
TX
78712
(Paper copy)
Local Availability- CES
Sponsor- / Department of Energy, Washington, DC (USA) Div. of
Geothermal Energy /
Corporate Author- Texas Univ., Austin
Bureau of Economic Geology
Austin, TX, USA
Auxiliary expression(s)-
Illus. / Diagram (3) / Photo (10) / Graph (13) / Map (1) / Figure (5) /
Ref.
Descriptor(s)- / Brazoria County / Depositional environment /
Diagenesis / Drill cores / Frio formation / Geopressured
reservoirs / Mineral composition / Permeability / Pleasant Bayou
No. 1 Well / Pleasant Bayou No. 2 Well / Porosity / Reservoir
properties / Sandstone /

Abstract by Author

Reservoir characteristics of Frio sandstones in the GCO/DOE Pleasant Bayou No. 1 and No. 2 wells are influenced by depositional environment, sandstone composition, and diagenetic history. The sandstones and shales were deposited in delta, plain, delta front, prodelta, and continental slope environments. Fluvial channel and distributary-mouth bar sandstones are most favorable for development and preservation of porosity. Sandstones in the geopressured zone are lithic arkoses and feldspathic litharenites. Depositional matrix (detrital material less than 20 um in size) occluded most or all of the potential primary porosity between grains in many of the fine-grained sandstones at the time of deposition. Quartz, calcite, and kaolinite cements reduced both primary and secondary porosity during diagenesis. The most porous sandstones contain no depositional matrix, but may contain abundant cement. Depositional matrix not only plugs pore spaces between grains but prohibits the flow of fluids that may create secondary porosity by the dissolution of grains. Cements are not abundant enough to prevent fluids from flowing through the sandstones. Consequently, even if cements are present, dissolution of grains and development of secondary porosity do take place. Permeable geopressured sandstone reservoirs are characterized by porosity that is dominantly secondary. The best reservoir in the geothermal test well is a medium-grained sandstone that was deposited in a traction load fluvial channel. This type of fluvial channel has good dip continuity, and in contrast to other types of fluvial channels it has good strike continuity.

327. GGIS-100422/R/ / /M/ / / / /

Title- Factors Controlling Reservoir Quality in Tertiary Sandstones and their Significance to Geopressured Geothermal Production

Subtitle- Annual Report for the Period May 1, 1979 - May 31, 1980

Author(s)- / Loucks, R.G. / Richman, D.L. / Milliken, K.L. /

Publication date- July 1980

Geopressured Geothermal Bibliography

Pagination- 200 Pages
Report/patent- DOE/ET/27111-1
Available- NTIS
 (Paper copy)
 (Microfiche)
Local Availability- CES
Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
 Geothermal Energy
 AC08-79ET-27111 /
Corporate Author- Texas Univ.
 Bureau of Economic Geology
 Austin , USA
Auxiliary expression(s)-
 Illus. / Diagram (1) / Photo (23) / Graph (47) / Map (1) / Figure (2) /
 Table
 Ref.
Descriptor(s)- / Brazoria County / Calcite / Chocolate Bayou
 Geothermal Field / Comparative evaluations / Consolidation /
 Diagenesis / Frio Formation / Geopressured reservoirs /
 Geothermal gradients / Gulf Coast / Hidalgo County / McAllen
 Ranch Geothermal Field / Mineralogy / Porosity / Precipitation /
 Production / Reservoir rocks / Resource assessment / Sandstone /
 Site selection / Tertiary Period / Texas / Vicksburg Formation /
Abstract by Author

Differing extents of diagenetic modification is the factor primarily responsible for contrasting regional reservoir quality of Tertiary sandstones from the Upper and Lower Texas Gulf Coast. Detailed comparison of Frio sandstones from the Chocolate Bayou/Danbury Dome area, Brazoria County, and Vicksburg sandstones from the McAllen Ranch Field area, Hidalgo County, reveals that extent of diagenetic modification is most strongly influenced by (1) detrital mineralogy and (2) regional geothermal gradients. Vicksburg sandstones are mineralogically immature and contain greater proportions of feldspars and rock fragments than do Frio sandstones. The reactive detrital assemblage of Vicksburg sandstones is highly susceptible to diagenetic modification. Susceptibility is enhanced by higher than normal geothermal gradients in the McAllen Ranch Field area. Thus, consolidation of Vicksburg sandstones began at shallower depth burial and precipitation of authigenic phases (especially calcite) was more pervasive than in Frio sandstones. Moreover, the late-stage episode of ferroan calcite precipitation that occluded most secondary porosity in Vicksburg sandstones did not occur significantly in Frio sandstones. Therefore, regional reservoir quality of Frio sandstones from Brazoria County is far better than that characterizing Vicksburg sandstones from Hidalgo County, especially at depths suitable for geopressured geothermal energy production.

328. GGIS-100210/R/ / /M/ / / / /

Title- Fault Control of Subsidence Houston-Galveston Area, Texas
 Subtitle- Research note 5
Author(s)- / Kreitler , Charles W. /
Publication date- 1976

Pagination- 17 Pages

Note- Preprint of article to appear in "Geoscience and Man."

Local Availability- GGIS

Corporate Author- Texas University, Austin

Bureau of Economic Geology

Austin, Texas, USA

Auxiliary expression(s)-

Illus. / Graph (6) / Map (6) / Photo (1) /

Descriptor(s)- / Fault activation / Fault control / Faults / Flooding
/ Fluid withdrawal / Galveston County / Ground subsidence /
Harris County / Hurricanes / Hydrologic barriers /

Abstract by Author

Land subsidence increases the area in the Texas coastal zone which will be inundated by marine waters from Hurricane flooding. Storm surge from a Carla-sized Hurricane in 1976 would flood at least 25 square miles more land than Hurricane Carla did in 1961. Land subsidence in Harris and Galveston Counties results primarily from ground-water production. The two-county area is interlaced with active surface faults with topographic escarpments and surface faults with no topographic escarpments that control drainage patterns and create subtle photographic linear patterns. Ground-water production activates these faults by differential compaction of the aquifer. The faults appear to be partial hydrologic barriers that compartmentalize land subsidence into several individual basins.

329. GGIS-100235/0/ / /A/ / / / /

Title- Faulting and Land Subsidence from Groundwater and Hydrocarbon Production, Houston-Galveston, Texas

Author(s)- / Kreitler, C. W. /

Conference- 2nd International Symposium on Land Subsidence

Anaheim, CA, USA (December 10, 1976)

Publisher- International Association of Hydrological Sciences
Paris

Publication date- 1977

Pagination- Page 435, 12 Pages

Report/patent- CONF-761217--

Descriptor(s)- / Fault activation / Faulting / Fluid withdrawal /
Galveston County / Gas production / Ground subsidence / Harris
County / Natural gas fields / Oil fields / Oil production /
Permeability barrier / Texas / Water production /

Abstract by TIC

Land subsidence in Harris and Galveston Counties, Texas, results from production of both ground water and hydrocarbon. Although ground water withdrawal (over 2 million cubic meters) is the predominant cause of land subsidence, subsidence and faulting are also associated with at least six oil and gas fields: South Houston, Clinton, Mykawa, Blue Ridge, Goose Creek, and Webster Fields. The two-county area is interlaced with active surface faults with topographic escarpments and surface faults which control drainage patterns and create subtle photographic linear patterns, but exhibit no topographic escarpments. Fluid production activates a given fault by differential compaction of the sediments on either side of the

Geopressured Geothermal Bibliography

fault. The faults appear to be partial fluid barriers that compartmentalize land subsidence. The Texas City area is an example of a subsidence compartment where subsidence has been restricted by growth faults. Correlation of electric log data from boreholes across the faults indicates as much as 21 M of displacement of sand beds within the Chicot Aquifer. This much offset of permeable beds is considered sufficient to create partial hydrologic barriers.

330. GGIS-100369/R/ / /M/ / / / /

Title- Feasibility Investigation and Design Study of Optical Well Logging Methods for High Temperature Geothermal Wells

Subtitle- Final Report

Author(s)- / Swanson , R. K. / Anderson , R. E. / Ash , J. I. / Beissner , R. E. / Smith , V. Devon /

Publication date- December 1977

Pagination- 121 Pages

Report/patent- SWRI-15-4706

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Department of Energy

E(40-1)5268 /

Corporate Author- Southwest Research Inst.

San Antonio , Texas , USA

Auxiliary expression(s)-

Illus. / Diagram (17) / Photo. (11) / Graph (39) /

Figure (2) /

Table

Ref.

Descriptor(s)- / Bottom hole temperature / Elevated temperature / Feasibility studies / Geothermal resources / High temperature / Quartz / Well logging /

Abstract by Author

This report documents the results of a one-year program designed to investigate the feasibility of optical techniques applied to well-logging, to extend measurement capabilities in high-temperature geothermal bore holes. The basic concept makes use of a special armored cable containing fiber optic wave guides, connected to passive, downhole optical transducers. The latter modulate an optical carrier in response to bore-hole parameters. The optical carrier is a beam of infrared light transmitted from an optical source at the surface over an optical fiber. The modulated beam from the transducer is then returned to the surface over a second fiber, where conventional optical communications techniques are used to detect and decode the down-hole information. Quartz, from which low-loss optical fibers are constructed, is virtually unaffected by temperatures at least as high as 600 DEG C. The use of optical signal transmission in well-logging offers the possibility of bypassing many problems normally associated with high-temperature operation. Since optical fibers are highly efficient communication channels, optical communication also offers the capability of measurements which require higher data rates than

conventional electrical cables permit. Since neither the optical fiber nor passive optical transducers require electrical power, problems associated with electronic devices at high-temperatures will not occur. However, the implementation of such an optical system must overcome formidable obstacles. Quartz fibers themselves exhibit inherently high tensile strength, but their relatively low ductility and susceptibility to brittle fracture, require new concepts in cable construction. Quartz also must be protected from direct contact with hot steam or water, requiring protective coatings which can tolerate the high temperatures encountered. Geothermal energy offers one of the most immediately available energy options under current investigation. A serious limitation in the evaluation of this resource lies in the inability to reliably make adequate geophysical measurements at those temperatures of greatest interest to successful geothermal exploitation. The optical approach offers one step along the path toward solving these difficulties.

331. GGIS-100373/R/ / /M/ / / / /

Title- Feasibility Investigation and Design Study of Optical Well Logging Methods for High Temperature Geothermal Wells

Subtitle- Semiannual Technical Progress Report, 30 September 1976-31 March 1977

Author(s)- / Swanson , R. K. / Beissner , R. E. / Smith , V. D. / Fogwell , J. W. /

Publication date- April 1977

Pagination- 54 Pages

Report/patent- ORO-5268-T1

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Energy Research and Development Administration

E(40-1)-5268 /

Corporate Author- Southwest Research Inst.

San Antonio , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (25) /

Ref.

Descriptor(s)- / Bottom hole temperature / Elevated temperature / Feasibility study / Geothermal resources / High temperature / Quartz / Well logging /

Abstract by Author

Measurement of the absorption-edge in the compound semiconductor GaAs show that changes in temperature over a range from 200 DEG C to 500 DEG C produce a cut-off transmission wavelength approximately coincident with the optimum spectral transmission region of quartz optical fibers. Thin GaAs elements are thus shown to be suitable for use as passive optical temperature transducers in the logging of high temperature geothermal wells in conjunction with fiber-optic cables. Stress effects on the optical transmission properties of quartz fibers, indicate increased attenuation amounting to approximately 5%, due to tensile stress of 90 ksi, or an elongation of 1%. Temperature

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effects on optical transmission were found to be negligible to 500 DEG C. Preliminary results of this study indicate that construction of a borehole geophysical cable based on single-fiber quartz waveguides is entirely feasible. Present upper temperature limits in successfully measuring certain geophysical parameters in boreholes can be extended appreciably by the use of such a cable in conjunction with passive optical transducers which require little or no down-hole electronics.

332. GGIS-100241/O/ / /A/ / / / /

Title- ~~Federal Role in Geothermal Resource Development~~

Author(s)- / Stephens, R. C. /

Conference- ~~Geothermal Resources Development Institute Conference~~
Salt Lake City

Utah

USA (January 27, 1977)

Publisher- ~~Rocky Mountain Mineral Law Foundation~~
Boulder, CO

Publication date- January 27, 1977

Pagination- 11 Pages

Report/patent- CONF-770135--

Descriptor(s)- / Energy source development / Geothermal resources /
Government policies / Institutional aspects / National
government / Regulations /

Abstract by TIC:

The components of the federal program mandated by PL 93-410 include, specifically: (1) resource inventory and assessment, (2) research and development, (3) demonstration, (4) scientific and technical education, and (5) loan guaranties. Included in the goals of the research and development effort were social, legal, and economic studies for the development of policy conducive to commercial geothermal development. ERDA has taken the lead role in policy development. This aspect is discussed in some detail, following a brief description of the program areas. Areas covered include: institutional development, federal land management, federal taxation, the geothermal loan guaranty program, state and local government, and federal incentives. (MHR)

333. GGIS-100103/R/ / /M/ / / / /

Title- ~~Final Report for the U.S. Energy Research and Development Administration, Lawrence Livermore Laboratory~~

Author(s)- / Hornburg, C. D. / Marin, C. D. /

Publication date- 1975

Pagination- Page 210

Report/patent- UCRL-13633

Corporate Author- ~~DSS Engineers~~
Ft. Lauderdale, Florida, USA

Descriptor(s)- / Temperature measurement / Chemical composition /
Pressure measurement / Fluid flow / Economics / Geopressured
systems / Geothermal wells / Flow rate / Injection wells / Waste
disposal / Nonelectrical / Process heat / Case histories /

Louisiana / Texas / Maps / Tables / Diagrams / Uses / Cost / Site selection /

334. GGIS-100222/J/ / /A/ / / / /

Title- First Gulf Coast Geopressured-Geothermal Test Completed

Author(s)- / Wieland , Denton R. /

Journal- Pet. Eng.

Publication date- Vol. 50 , Issue 4 , April 1978

Pagination- Page 72 , 9 Pages

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (10) /
Table

Descriptor(s)- / Edna Delcambre No. 1 Well / Geopressured wells / Louisiana / Sand production / Surface equipment / Water production / Well characteristics / Well completion / Well data / Well drilling / Well testing /

Abstract by Energy Info. Abstracts

Tests of the geopressured-geothermal resource of the Edna Delcambre No. 1 Well in Louisiana have been conducted. OHRW Engineering oversaw drilling, completion of the disposal well, testing of the sands at depths of 12,900 Ft. and 12,500 Ft., and plugging of the well. The completion design, assembly, surface equipment used, and test schedule are described. Data on temperature, pressures, and water production are tabulated. Sand production occurred during one of the test flow periods; problems resulting from sand production are summarized.

335. GGIS-100556/R/ / /M/ / / / /

Title- Flow Characteristics in Geopressured Zones and Salt Water Aquifers

(Annual Report Sept. 1980 - Aug. 1981)

Author(s)- / Amirijatari , Bahram / Rigby , Fred /

Publication date- September 1981

Pagination- 93 Pages

Report/patent- PB82-181280

Available- NTIS

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRI-5014-321-0251 /

Corporate Author- Science Applications, Inc.

Golden , CO , USA

Descriptor(s)- / Aquifers / Artificial recharge / Geopressured zones / Mathematical models / Models / Production / Saline aquifers /

Abstract by NTIS

A simple numerical model was developed to investigate the effects of gas evolution in geopressured flow and used to study the combined effects of production strategy, completion design, and aquifer characteristics on production and reinjection. Well cost estimates were made and tradeoffs between well cost and increased productivity for some well design options were calculated. Model requirements for predicting aquifer pore clogging were discussed.

336 GGIS-100995/ / / /A/ / / / /

Title- Fluidized Bed Low-Temperature Geothermal Drying

Author(s)- / Schmitt, R.C. / Cole, L.T. / Oates, J.H. /

Publication date- Vol. 2, Issue 2, 1978

Pagination- Page 591, 2 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (1) /

Descriptor(s)- / Agriculture / Direct energy utilization / Geothermal heating / Moderate temperature / Waste management /

Abstract by Author (rev.)

EG&G Idaho, Inc., is commencing a series of low temperature geothermal drying experiments at the Raft River Geothermal Site. This paper will delineate the results from the initial test work, particularly as it pertains to the use of geothermal heat in drying operations on waste materials from potato processing operations. However, the experiment has the potential for stimulating a more widespread direct use of geothermal energy since there may be numerous applications for a system of this type in food processing operations, agriculture (grain, sugar beet pulp, alfalfa, onion drying operations are a few examples), and waste management.

337 GGIS-100899/0/ / /A/ / / / /

Title- Fluidized Bed Heat Exchangers for Geothermal Applications

Author(s)- / Allen, C.A. / Grimmett, E.S. / Wagner, K.L. /

Conference- 11 Intersociety Energy Conversion Engineering Conference

Pagination- Page 761, 7 Pages

Report/patent- SAE--769132

Corporate Author- Allied Chemical Corp.

Idaho Falls, Idaho, USA

Auxiliary expression(s)-

Illus. / Diagram (3) / Graph (2) / Photo. (1) /

Ref.

Descriptor(s)- / Design / Fluidized bed heat exchangers / Fouling / Geothermal brines / Heat transfer / Scaling /

Abstract by Author

Bench-scale liquid-fluidized bed heat exchangers used with geothermal water prevented fouling and nearly doubled the rate of heat transfer compared to identical tube and shell arrangements. A six-inch pressurized unit operated at the Raft River geothermal site near Malta, Idaho verified these results. Horizontal and vertical configurations and other design considerations are discussed. Insufficient data currently exists to make valid correlations for scale-up for demonstration or commercial size units. An experimental program is in progress to correct this deficiency.

338. GGIS-100898/J/ / /A/ / / / /

Title- Forecasting of Overpressure Formations Experiences in Hungary

Author(s)- / Csaba , J. /

Publication date- Vol. 19 , Issue 2 , 1976

Pagination- Page 27 , 6 Pages

Descriptor(s)- / Forecasting / Geopressure exploration / Hungary / Reservoir description /

339. GGIS-100449/R/ / /M/ / / / /

**Title- Formation Temperature Gauge Feasibility Study
(Interim Report)**

Subtitle- Volume 2

Publication date- Vol. 2 , March 9 , 1977

Pagination- 51 Pages

Report/patent- SAN-0936P48-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy

EY-76-C-03-0936-048 /

Corporate Author- IRT Corp.

San Diego , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (3) / Graph (19) /

Descriptor(s)- / Experimental results / Feasibility studies / Formation testing / Kinetic energy / Mathematical models / Measuring instruments / Neutron logging / Numerical solution / Reservoir temperature / Temperature measurement / Theoretical treatments /

Abstract by GGIS

An experimental temperature gauge is being tested which determines the temperature of a geothermal formation by sampling of the neutrons propagating or diffusing through it. When neutrons with kinetic energy higher than a few electron volts (eV) (fast neutrons) enter a medium or "moderator," they lose their energy through collisions to the surrounding atoms. This process is called neutron slowing down, and it will continue until the neutrons reach thermal equilibrium with the moderator. In this state a neutron will diffuse through the moderating medium until it is absorbed or decays. An equation is given which shows that the temperature of a moderating medium can be determined by sampling the energy state of the thermal (sub-electron volt-range) neutrons diffusing through it. When the medium is the formation surrounding a geothermal well, this measurement requires a source for introducing fast neutrons into the formation and a device for sampling of those which have been thermalized. For this feasibility study, ^{252}Cf was chosen as a neutron source, and a ^3He filled neutron detector was selected because of its high efficiency and ready availability. Neutron

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filters of boron, samarium, and gadolinium were compared on the basis of calculations. The experimental arrangement to verify the calculations is described. Experiments will be conducted to measure temperature gauge response under various formation and borehole conditions.

340. GGIS-100334/ / / /M/ / / / /

Title- Frio Sandstone Reservoirs in the Deep Subsurface Along the Texas Gulf Coast

Subtitle- Their Potential for the Production of Geopressured Geothermal Energy

Author(s)- / Bebout, D.G. / Loucks, R.G. / Gregory, A.K. /

Publication date- 1978

Pagination- 93 Pages

Available- Bureau of Economic Geology

University of Texas at Austin

University Station

Box X

Austin

Texas

78712

(Paper Copy)

Corporate Author- Texas Univ., Austin

Bureau of Economic Geology

Austin, Texas, USA

Auxiliary expression(s)-

Illus. / Figure (106) /

Table

Descriptor(s)- / Austin Bayou prospect / Brazoria County / Elevated temperature / Fairway analysis / Frio formation / Geological surveys / Geophysical surveys / Geopressured reservoirs / Gulf Coast / Permeability / Texas /

Abstract by Author

The Frio formation of the subsurface Tertiary section in the Gulf Coast Basin has been the focus of extensive evaluation for potential resources of geopressured geothermal energy. This report represents a comprehensive summary of the Bureau's geothermal programs in the Frio, which have culminated in the selection of Texas' first test-well site for geothermal production. The Hidalgo, Armstrong, Corpus Christi, Matagorda, and Brazoria fairways are delineated in this report. The Austin Bayou Prospect in the Brazoria fairway of Galveston and Brazoria Counties is pinpointed as the most suitable site for Frio geothermal production. At this site, 250 to 350 feet of reservoir sandstone occurs with core permeabilities between 40 and 60 millidarcys and fluid temperatures from 300 DEG to 350 DEG F. Detailed geological, geophysical, and engineering studies have been applied to delineate the Austin Bayou test-well site.

341. GGIS-100224/B/ / /A/ / / / /

Title- Frontier Areas and Exploration Techniques

(In Geology of Alternate Energy Resources in the South-Central United States)
 Subtitle- Geopressured Geothermal Energy in the South-Central United States
 Author(s)- / Jones , P. A. /
 Publisher- Houston Geological Society
 Houston, Texas
 Publication date- 1977
 Pagination- Page 215 , 36 Pages
 Available- Geothermal Information Services
 318 Cherrywood St.
 West Covina
 CA
 91791)
 Descriptor(s)- / Exploration methods / Geopressure exploration / Geopressured systems / Gulf Coast / Maps / Seismic surveys / Subsurface mapping / Well logging /
 Abstract by TIC

The Mississippi Salt Dome Basin occupies a rift which opened at the time the Gulf Basin was formed, but was superseded by a rift to the south, now occupied by the Gulf Coast Geosyncline and the Gulf Coast Salt Dome Basin. Seismic and borehole logging methods were used in mapping fluid pressure; borehole logging methods provide data for isothermal mapping; seismic and borehole logging methods provide the data for structure mapping; borehole methods, mainly electric logging, provide the data for sand-bed reservoir mapping and for isosalinity mapping. Together, these maps provide the information necessary for selection and evaluation of prospects for geopressured geothermal energy development.

 342. GGIS-100065/J/ / 2903/A/ / / / /

Title- Future Developments in the Utilization of Geothermal Energy

Author(s)- / Fanelli , M. /
 Journal- Termotecnica (Milan)
 Publication date- Vol. 29 , Issue 3 , May 1975
 Pagination- Page 140 , 5 Pages
 Language- Italian
 Descriptor(s)- / China / El Salvador / Electric power / Exploitation / Geopressured systems / Geothermal energy / Geothermal power plants / Hot dry rock systems / Iceland / Italy / Japan / Mexico / New Zealand / Reviews / Turkey / USA / Uses / USSR / West Indies /

 343. GGIS-100516/R/ / /M/ / / / /

Title- Future Role of Geopressured Resources in US Energy Policy

(Final Report, July 1, 1978 - March 31, 1979)
 Subtitle- A Scenario Approach and Analysis
 Author(s)- / Brown , W. M. /
 Publication date- April 3 , 1979
 Pagination- 66 Pages
 Report/patent- C00-4955-1

Geopressured Geothermal Bibliography

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC02-78ET28474 /

Corporate Author- Hudson Inst., Inc.

Croton-on-Hudson, NY, USA

Descriptor(s)- / Economic impact / Economics / Energy demand / Energy reserves / Energy source development / Energy supplies / Government policies / Gulf Coast / Hydrocarbons / Methane /

Abstract by NTIS

The potential contribution of future geopressured energy - especially methane - to the US and the world's needs is examined through several scenarios. Although such production may not become competitive, if it does the eventual producible reserves from the Gulf Coast region seem likely to fall between 100 and 10,000 quads. The world's potential from similar resources is not known but may well be ten times as great. The contribution to the projected future demand for hydrocarbons is found to become substantial in most of the success scenarios. The potential impact on fuel imports and their future prices is discussed. Although technical uncertainties are far too great at present for accurate projections, this could change rapidly as field data becomes available from DOE's R and D program.

344. GGIS-100176/O/ / /M/ / / / /

Title- Future Supply of Nature-Made Petroleum and Gas

Subtitle- 1. Unitar Conference on Energy and the Future

Author(s)- / Meyer, R. F. /

Conference- Unitar Conference on Energy and the Future

Laxenburg, Austria (July 5, 1976)

Publisher- Pergamon Press, Inc.

Elmsford, N. Y.

Publication date- 1977

Pagination- 1085 Pages

Report/patent- CONF--760763

345. GGIS-100374/O/ / /A/ / / / /

Title- FLOSCAL--

(3. Session: EPRI Progress Reports)

Subtitle- A Computer Code for Predicting Scale Formation in Geothermal Systems

Author(s)- / Lessor, D. L. / Kreid, D. K. / Cheatham, R. L. /

Conference- 3rd Annual Geothermal Conference and Workshop Proceedings

Monterrey

California

USA- (June 26, 1979)

Publisher- Electric Power Research Institute

Palo Alto, California

Publication date- October 1979

Pagination- Page 4, 5 Pages

Report/patent- EPRI-WS-79-166

Local Availability- CES

Corporate Author- Battelle Pacific Northwest Labs.
Richland , Washington , USA

Auxiliary expression(s)-

Illus. / Figure (1) / Diagram (1) /

Table

Ref.

Descriptor(s)- / Chemical composition / Computer codes / Corrosion /
Forecasting / Geothermal brines / Scaling /

Abstract by Author

FLOSCAL is a computer program that may be used to predict the chemical composition, rate of formation, and distribution of mineral scale and iron corrosion products in a mineral laden aqueous flowstream. FLOSCAL is one of a family of geothermal scaling codes (EQUILIB, FLOSCAL, PLANT, and GEOSCALE) that have recently been developed by Battelle-Northwest under the sponsorship of the Electric Power Research Institute. The purpose of these codes is to provide an analytical tool for predicting scaling and consequent performance degradation in geothermal power generating plants and associated facilities. This paper provides a description of FLOSCAL capabilities and limitations. We will also describe the other codes in the family for perspective.

346. GGIS-100130/R/ / /M/ / / / /

Title- FY 1974 Program Plan for Geothermal Project

Author(s)- / Brugger , R. M. / Kunze , J. F. /

Publication date- February 5 , 1974

Pagination- 71 Pages

Report/patent- ANCR-1139

Sponsor- / US AEC /

Corporate Author- Aerojet Nuclear Co.

National Reactor Testing Station

Idaho Falls , Idaho , 83401 , USA

Descriptor(s)- / Demonstration programs / Economics / Elevated
temperature / Geothermal energy / Geothermal power plants / Raft
River KGRA /

Abstract by NSF/RANN

The postulated end objective for the program is to construct and operate a power plant on relatively low temperature hot water (nominally 150 degrees C or 300 degrees F). The likely location for the plant is in the Raft River Valley. The principal purpose of the program is to determine, by actual demonstration, the economic conditions for which low temperature systems can be expected to operate. If successful in this endeavor, such resources will then be developed by others contemplating utilizing geothermal energy for large scale commercial endeavors. (auth. from purpose)

347. GGIS-100503/R/ / /M/ / / / /

Geopressured Geothermal Bibliography

**Title- G.M. Koelemay Well No. 1, Jefferson County, Texas. Volume I.
Completion and Testing**
(Final Report)

**Subtitle- Testing Geopressured Geothermal Reservoirs in Existing
Wells**

Publication date- Vol. 1 , 1980

Pagination- 241 Pages

Report/patent- DOE/ET/27081-3

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80ET27081 /

Corporate Author- Eaton Operating Co., Inc.

Houston , TX

**Descriptor(s)- / Analysis / Bottom hole pressure / Drilling / G.M.
Koelemay Well No. 1 / Geology / Geopressured reservoirs /
Geothermal wells / Jefferson County / Methane / Natural gas /
Production / Reentry / Texas / Well completion /**

Abstract by NTIS

The acquisition, completion and testing of a
geopressured-geothermal well are described. The following are
covered: geology; petrophysics; re-entry and completion
operations -- test well; drilling and completion operations --
disposal well; test objectives; surface testing facilities;
pre-test operations; test sequence; test results and analysis;
and return of wells and location to operator.

348. GGIS-100502/R/ / /M/ / / / /

**Title- G.M. Koelemay Well No. 1, Jefferson County, Texas. Volume
II. Well Test Data**
(Final Report)

**Subtitle- Testing Geopressured Geothermal Reservoirs in Existing
Wells.**

Publication date- 1980

Pagination- 403 Pages

Report/patent- DOE/ET/27081-3

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80ET27081 /

Corporate Author- Eaton Operating Co., Inc.

Houston , TX

**Descriptor(s)- / Bottom hole pressure / Bottom hole temperature / Data
/ Experimental results / Field studies / G.M. Koelemay Well No. 1
/ Geopressured reservoirs / Geothermal wells / Jefferson County
/ Texas / Well logging /**

Abstract by NTIS

The following are included in the appendices: field test
data; combined and edited raw data; time/ pressure data; sample
log; reservoir fluid study; gas data; sample collection and

analysis procedure; scale monitoring and water analysis; sand detector and strip charts; and Horner-type plot data.

349. GGIS-100299/J/ / /A/ / / / /

Title- Gas and High-Pressure Water Find in Louisiana Termed Significant

Publisher- Twin Coast Newspapers, Inc.
New York, NY

Journal- J. Commerce

Publication date- Vol. 332 , Issue 2398 , June 21 , 1977

Pagination- Page 8 , 1 Pages

Descriptor(s)- / Gas production / Geopressured reservoirs /
Geopressure zones / Geothermal brines / Louisiana / Natural gas /
Water production /

Abstract by PROMPT

Natural gas and hot, high-pressure salt water have been found trapped two miles beneath a Louisiana bayou. The discovery raised hope among government experts that Gulf coast reservoirs may hold major untapped reserves which might double supplies of natural gas, the US' most precious fuel, and provide geothermal energy as a bonus. Researchers working under government contract reopened an abandoned gas well 25 miles south of Lafayette, La., to check the potential for getting energy from high-pressure subterranean pockets called "geopressured zones." Preliminary analysis showed a two-week test at a depth of 12,900 feet produced 200,000-1.5 million cubic feet of gas/day, plus 10,300 bbls/day water at 240 DEG F.

350. GGIS-100066/J/ / /A/ / / / /

Title- Gas in Geopressured Wells

Publication date- Vol. 185 , Issue 2 , 1977

Descriptor(s)- / Geopressured wells / Louisiana / Natural gas / Well stimulation /

351. GGIS-100176/O/ / /A/ / / / /

Title- Gas in Geopressured Zones

Author(s)- / Jones , P. H. /

Conference- Unitar Conference on Energy and the Future
Laxenburg, Austria (July 5 , 1976)

Publisher- Pergamon Press, Inc.
Elmsford, N. Y.

Publication date- 1977

Pagination- Page 889 , 23 Pages

Report/patent- CONF--760763

Descriptor(s)- / Dissolved gases / Geology / Geopressure resources /
Geopressured zones / Gulf Coast / Methane / Natural gas / Coastal
regions / Exploration / Geological surveys / Geopressured
systems / Global aspects / Gulf of Mexico / Interstitial water /
Kerogen / Natural gas deposits / Sedimentary rocks / USA /

Geopressured Geothermal Bibliography

Abstract by DOE/RECON

The natural gas resources in geopressured zones worldwide are very great if they are comparable to those in the Northern Gulf of Mexico Basin. The geology of geopressured zones is discussed with emphasis on the U. S. Gulf of Mexico Basin. The world's known geopressured zones are identified and described. Methane, produced by the thermal degradation of petroleum in the geopressured zone, is dissolved in the formation waters of the zone. This natural gas in water solution can contribute greatly to future energy supplies.

352. GGIS-100463/R/ / /M/ / / / /

Title- Gas Evolution from Geopressured Brines

Author(s)- / Matthews , C.S. /

Publication date- June 1980

Pagination- 156 Pages

Report/patent- DOE/TIC-11227

Available- NTIS

(Paper copy)

(Microfiche)

Corporate Author- Department of Energy

Washington, D.C. , USA

Descriptor(s)- / Carbon dioxide / Dissolved gases / Evolution / Feasibility studies / Gas caps / Gas production / Geopressured reservoirs / Geothermal brines / Migration / Models / Natural gas / Porous media / Pressure drop / Resource assessment / Solubility / Testing / Well completion /

Abstract by ERA

The process of gas evolution from geopressured brine is examined using as a basis the many past studies of gas evolution from liquids in porous media. A discussion of a number of speculations that have been made concerning gas evolution from geopressured brines is provided. According to one, rapid pressure reduction will cause methane gas to evolve as when one opens a champagne bottle. It has been further speculated that evolved methane gas would migrate up to form an easily producible cap. As a result of detailed analyses, it can be concluded that methane gas evolution from geopressured brines is far too small to ever form a connected gas saturation except very near to the producing well. Thus, no significant gas cap could ever form. Because of the very low solubility of methane in brine, the process of methane gas evolution is not at all analogous to evolution of carbon dioxide from champagne. A number of other speculations and questions on gas evolution are analyzed, and procedures for completing wells and testing geopressured brine reservoirs are discussed, with the conclusion that presently used procedures will provide adequate data to enable a good evaluation of this resource.

353. GGIS-100897/ / / /A/ / / / /

Title- Gas Recovery from Unconventional Sources

Author(s)- / Pitrolo , A. A. / Schrider , L. A. / Overbey , W. K. /
 Wise , R. L. /
 Publisher- Gov. Inst., Inc.
 Washington, D. C.
 Publication date- Vol. 6 , 1979
 Pagination- Page 483 , 12 Pages
 Local Availability- CES
 Corporate Author- U. S. Department of Energy
 Morgantown Energy Research Center
 Morgantown , West Virginia , USA
 Auxiliary expression(s)-
 Illus. / Diagram (2) / Map (2) /
 Table
 Ref.
 Descriptor(s)- / Energy source development / Energy sources /
 Financing / Gas production / Geopressed reservoirs /
 Investment / Methane / Research programs /
 Abstract by Energyline
 Unconventional sources of natural gas are identified. The federal government must complement industry's efforts in the R & D necessary to lead to full commercialization of these resources. Research needs for production of tight gas sands in several western states are surveyed. Gas shale deposits in eastern states are discussed. The feasibility of obtaining methane from coal beds, and problems associated with commercial exploitation of Gulf Coast geopressed aquifers are examined.

 354. GGIS-100417/R/ / /M/ / / / /

Title- Gas Saturation in Formation Waters

Subtitle- Annual Report for 1979

Author(s)- / Randolph , Philip L. / Rockar , Evelyn M. / Osif , Terry L. /

Publication date- May 1980

Pagination- 84 Pages

Report/patent- PB81-130759

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRI-5011-321-0140 /

Corporate Author- Institute of Gas Technology

Chicago , IL , USA

Auxiliary expression(s)-

Illus. / Diagram (3) / Photo (7) / Graph (2) /

Table

Ref.

Descriptor(s)- / Beulah Simon No. 2 Well / Boreholes / Dissolved gases /
 Fairfax Foster Sutter No. 2 Well / Fluid sampline / Gas analysis /
 Geopressed reservoirs / Geothermal brines / Gulf Coast / Hydrogen / Iron / Louisiana / pH value / Pleasant Bayou No. 2 Well / Texas / Thermodynamics / Water chemistry /

Abstract by Author (rev.)

The purpose of this program is to increase our knowledge of the chemistry of formation waters from geopressed-geothermal

Geopressured Geothermal Bibliography

reservoirs. A program of down-hole sampling, chemical analysis, and thermodynamic reconstruction was carried out.

355. GGIS-100528/O/ / /A/ / / / /

Title- Gas/Brine Ratio from Tests of Five Wells of Opportunity
(Abstract)

Author(s)- / Randolph , Philip L. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 179 , 1 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)
DE-AC08-80ET27081 /

Descriptor(s)- / Brines / Dissolved gases / Flow rate / Natural gas / Solubility / Steam separators / Wells of opportunity /

356. GGIS-100342/J/ / /A/ / / / /

Title- Geo-Science Related Aspects of Geopressure Energy

Author(s)- / Chopra , Prem S. / Saxena , Surendra K. /

Journal- J. Energy Div., ASCE

Publication date- Vol. 105 , Issue 2 , August 1979

Pagination- Page 213 , 16 Pages

Auxiliary expression(s)-

Illus. / Diagram (2) / Map (1) /
Ref.

Descriptor(s)- / Environmental effects / Geochemistry / Geology / Geopressured reservoirs / Hydrogeology / Louisiana / Reservoir engineering / Texas / Geophysics / Geological surveys / Lithology / Ground subsidence / Mathematical models / Waste water / Waste disposal /

Abstract by Compendex

Geo-science related aspects of geopressured energy have been critically reviewed. Geopressure is defined as any pressure that exceeds the hydrostatic column of water extending from the reservoir zone to the land surface. The U. S. Geological Survey estimates that the thermal-mechanical energy in geopressure reservoirs in the Texas and Louisiana coasts alone is about 34,000 MW-centuries. This paper has attempted to cover reservoir geology, geomechanics, and geochemistry and their synergy in exploitation strategy has been highlighted. The need for new analytical models covering the response of the geomass, consisting of rock matrix and sediment clay, and its intercoupling with the motion of the geofluids in the presence of terrestrial heat flow is stressed. The effect of reservoir geometry in the selection of reservoir well spacing has been discussed.

357. GGIS-100529/R/ / /M/ / / / /

Title- Geochemical Engineering Problem Identification and Program Description

(Final Report)

Author(s)- / Crane , Christopher H. / Kenkerematn , Deepak C. /

Publication date- May 1981

Pagination- 72 Pages

Report/patent- DOE/ID/12183-T2

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy

AC07-80ID12183 /

Corporate Author- Engineering and Economics, Inc.

Falls Church , VA , USA

Auxiliary expression(s)-

Illus. / Diagram (3) / Figure (6) / Graph (2) /

Table

Ref.

Descriptor(s)- / Energy conversion / Energy source development / Geothermal energy / Geothermal fluids / Geothermal industry / Industry / Research programs / Technology assessment /

Abstract by GGIS

The status and strategy of the Geochemical Engineering Program is described. These areas are discussed: the magnitude and scope of geochemical-related problems constraining geothermal industry productivity; the goals of this DGE program; the rationale and strategy of the program; and the structure, priorities, funding and management of program elements.

358. GGIS-100153/O/ / /A/ / / / /

Title- Geochemical Methods for Geothermal Water Samples

Subtitle- Trans-Pecos, Texas

Author(s)- / Curtis , R. E. /

Conference- 11th Annual Meeting of the Geological Society of America, South-Central Section

El Paso

Texas

USA (March 17 , 1977)

Publication date- Vol. 9 , January 1977

Pagination- Page 13 , 2 Pages

Corporate Author- Texas University, El Paso

El Paso , Texas , USA

Descriptor(s)- / Calcium / Chemical analysis / Chlorine / Dissolved solids / Fluorine / Geochemical surveys / Geothermal exploration / Geothermometry / Hot springs / Lithium / Potassium / Silicon / Sodium / Texas / Trans-Pecos hot rocks / Water analysis / Water chemistry / Water springs /

Abstract by ERA

Geopressured Geothermal Bibliography

Over 700 water samples from hot to cold springs and wells have been collected from a six County area of approximately 22,000 square miles in West Texas. Geochemical studies of the waters are in progress to locate possible hot water geothermal sites in the region. For each water sample information concerning depth of the well, rate of discharge, color and turbidity, and geologic occurrences of the water were recorded. Samples have been analysed for sodium, potassium, calcium, lithium, and silicon by atomic absorption and fluoride and chloride by specific ion electrodes. The analyses show the following concentrations in PPM: sodium, 2-2,400; potassium, 0.1-215; calcium, 0.4-693; lithium, 0.0-3.2; silicon, 4-82; fluoride, 0.2-19; and chloride, 2.1-3,400. A Kernco DS meter was employed to determine dissolved solids content which range from 200 to 11,000 PPM. In addition, the samples are currently being analyzed for uranium, magnesium, beryllium, boron, mercury, arsenic, and strontium. The Na-Ca-K and SiO₂ geothermometers have been calculated from above analyses and used to indicate the most favorable geothermal sites.

359. GGIS-100393/O/ / /A/ / / / /

Title-- Geochemistry of Formation Waters from Pleasant Bayou No. 2 Well and Adjacent Areas in Coastal Texas

Author(s)-- / Kharaka, Yousif K. / Lico, Michael S. / Wright, Victoria A. / Carothers, William W. /

Publisher-- 4th Geopressured Geothermal Energy Conference

Publication date-- Vol. 1, June 1980

Pagination-- Page 168, 32 Pages

Available-- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

78712

(Paper copy)

Local Availability-- CES

Corporate Author-- Geological Survey

Menlo Park, CA, USA

Auxiliary expression(s)--

Illus. / Graph (3) /

Table

Ref.

Descriptor(s)-- / Brazoria County / Brines / Chemical composition / Dissolved gases / Dissolved solids / Geochemistry / Injection / Interstitial water / Methane / Pleasant Bayou No. 2 Well / Salinity / Waste disposal / Waste water /

Abstract by Author--

Pleasant Bayou No. 2 in Brazoria County, Texas, is the first well drilled and completed exclusively for evaluating the energy resources from geopressured-geothermal zones. Water samples were obtained from two sandstone units in the geopressured zone (4,737-4,740m and 4,453-4,471m) during production tests of these units. Thirty formation-water samples were also obtained from normally and geopressured zones from five oil and gas fields located to the east and north of the test well in Brazoria and

Galveston Counties, Texas. All the samples are from sandstone units within the Frio Clay of Oligocene (?) age. Detailed chemical and isotope analyses of the waters show that: (1) the salinities of water from Pleasant Bayou well are 110,000 and 130,000 mg/L for the lower and upper sandstone units, respectively; (2) the salinity of water in the geopressed zone from the oil and gas fields ranges from about 55,000 to 75,000 mg/L dissolved solids--the salinity of water in the overlying normally pressured zone is lower and the two waters are not chemically compatible; (3) all the formation waters are modified marine connate waters of the Na-Cl type; (4) Na and Cl constitute more than 90 and 95 percent of cations and anions, respectively; and (5) the concentrations of H₂S (less than 2 mg/L), SiO₂ (less than 120 mg/L), and toxic trace metals are low in comparison with most geothermal waters, but the concentrations of boron (as much as 90 mg/L) and NH₃ (as much as 120 mg/L) are moderately high. The formation waters from Pleasant Bayou No. 2 are saturated with methane; the amount of methane produced, however, is about half of the solubility of methane in fresh water at the same temperatures and pressures. The CO₂ content of this gas (up to 10 mole percent) is much higher than that of natural gas produced from oil and gas wells. Subsurface injection is the method planned for the disposal of spent waters from Pleasant Bayou well. Careful evaluation of the compatibility of these waters with the waters in the injection aquifers will be required to minimize porosity reduction due to precipitation of minerals. Also, the presence of faults in the area and the large volumes of fluids involved may require monitoring wells to detect any pollution of the groundwaters.

360. GGIS-100170/J/ / /A/ / / / /

Title- Geochemistry of Geopressed Geothermal Waters from the Frio Clay in the Gulf Coast Region of Texas

Author(s)- / Kharaka , Y. K. / Callender , E. / Wallace , R. H., JR.

Publication date- Vol. 5 , Issue 4 , April 1977

Pagination- Page 241 , 4 Pages

Descriptor(s)- / Acid carbonates / Ammonia / Boron / Calcium / Chemical analysis / Chlorine / Clay / Geochemistry / Geopressed systems / Geothermometry / Gulf of Mexico / Hydrogen sulfide / Iron / Magnesium / Manganese / Natural gas / Natural gas wells / Oil wells / PH value / Potassium / Pressure measurement / Quartz / Rubidium / Salinity / Silica / Sodium / Strontium / Sulfates / Temperature measurement / Texas / Thermal waters / Dilution / Dissolved solids / Frio Formation / Galveston County / Gulf Coast / Harris County / Interstitial water / Nueces County /

Abstract by DOE/RECON

Detailed chemical analyses of 54 formation-water samples from the Frio Clay from 11 oil and gas fields in the Houston-Galveston and Corpus Christi areas, Texas, indicate that the salinity of water in the geopressed zone ranges from about 20,000 to 70,000 MG/L dissolved solids. Samples from many gas wells yield low salinities that are not representative of the true salinity of formation water because of dilution by

Geopressured Geothermal Bibliography

condensed water vapor produced with natural gas. Quartz and Na-K-Ca geothermometers are used in conjunction with the measured subsurface temperatures to identify the diluted samples and to estimate their true salinities.

361. GGIS-100528/0/ / /A/ / / / /

Title- Geochemistry of Hydropressured Brines in South Louisiana
Subtitle- Potential for Reaction with Injected Geopressured Waste Waters

Author(s)- / Hanor , Jeffre S. /
Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 153 , 6 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy
DE-A505-78ET2702

Sponsor- / Louisiana Dept. of Natural Resources, Interagency Agreement 11010301790 3, Geopressured Geothermal Research and Development Program: Geochemistry and Hydrology /

Auxiliary expression(s)-

Illus. / Graph (5) / Map (4) /

Table

Ref.

Descriptor(s)- / Brines / Cost / Economics / Louisiana / Waste disposal / Waste water /

Abstract by Author

Hydropressured, saline water sands are being considered as possible sites for the disposal of geopressured-geothermal waste waters in South Louisiana. Probable injection horizons would most likely contain native brines of 120-140 g/l TDS. These brines show wide ranges in concentration of dissolved Ca, Sr, Ba, Fe, SO₄, and HCO₃, even within a restricted range of salinities. The probability is high that mineral precipitation will occur if untreated geopressured wastes are mixed with these waters. Clay migration and additional plugging of the injection well is possible if the injected wastes are significantly less saline than the native fluids. Costs of site-specific geochemical evaluation and chemical pre-treatment are thus factors which must be considered in the economic evaluation of deep well disposal of geopressured wastes in South Louisiana.

362. GGIS-100026/ / / /A/ / / / /

Title- Geochemistry of Some Formation Waters from Louisiana Reservoirs with Normal and Abnormal High Pressures

Author(s)- / Collins , A. G. / Dickey , Parke A. /

Publisher- American Chemical Society

Publication date- 1970

Descriptor(s)- / Louisiana / Hydrogeology / Ground water / Southwest / Connate water / United States / Geochemistry / Geopressured

reservoirs / Overburden pressure / Pressure buildup /
 Statistical analysis / Interpretation / Geopressure /

 363. GGIS-100527/R/ / /M/ / / / /

Title- Geologic Data for Borehole ERDA-6, Eddy County, New Mexico

Author(s)- / Jones , C.L. /

Publication date- 1981

Pagination- 63 Pages

Report/patent- USGS-OFR-81-468

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-76NV00038 /

Corporate Author- Geological Survey

Denver , CO , USA

Descriptor(s)- / Anhydrite / Brines / Data / Geology / Geopressured
 systems / Mesozoic Era / New Mexico / Permian Basin / Quaternary
 Period / Radioactive wastes / Rock properties / Rocks / Salts /
 Site selection / Triassic Period / Waste disposal /

Abstract by NTIS

ERDA-6 is an exploratory test hole drilled in Eastern Eddy
 County, New Mexico, to evaluate a candidate site for a nuclear
 waste repository which was subsequently rejected on the basis of
 geologic data. The rocks penetrated include surficial deposits
 of quaternary age; the Santa Rosa Sandstone of Triassic age; and
 the Dewey Lake Red Beds, the Rustler Formation, the Salado
 Formation, and part of the Castile Formation, all of Permian age.
 The pre-Quaternary rocks are sharply deformed into an anticline
 that has a faulted core of salt and anhydrite containing a
 reservoir of geopressured brine carrying H sub 2 S, CO sub 2, in
 solution. The structure of the rocks and the geopressured brine
 are severe geologic impediments to the design, construction, and
 operation of a nuclear waste repository at the candidate site.

 364. GGIS-100153/O/ / /A/ / / / /

Title- Geologic Setting of Hot Springs

Subtitle- Trans-Pecos, Texas and adjacent Mexico

Author(s)- / Henry , C. D. /

Conference- 11th Annual Meeting of the Geological Society of America,
 South-Central Section

El Paso

Texas

USA (March 17 , 1977)

Publication date- Vol. 9 , January 1977

Pagination- Page 25 , 1 Pages

Corporate Author- Texas University, Austin

Austin , Texas , USA / Evaporites / Extrusive rocks / Geologic
 control / Geological setting / Hot springs / Limestone / Mexico /
 Normal faults / Texas / Thermal waters / Trans-Pecos hot rocks /

Abstract by ERA

Geopressured Geothermal Bibliography

Hot springs in Trans-Pecos Texas (up to 47 DEG C) and adjacent Mexico (up to 80 DEG C) are found in a zone along the Rio Grande between the Quitman Mountains and Big Bend National Park. Two distinct types of springs occur: fault-controlled and stratigraphically-controlled springs. Most hot springs are on or immediately basin-ward of major northwest-trending, basin margin normal faults. Other springs occur either along similar normal faults more basinward or those cutting middle Tertiary or older bedrock. Springs of both types are located in topographically low areas. It is probable that thermal waters are present in other localities but discharge into highly permeable bolson sediments without reaching the land surface as springs. Thermal waters are in contact with limestone, siliceous volcanic rocks, bolson deposits composed of volcanic rocks and limestones, and evaporites. Chemical equilibrium of the thermal waters should be controlled by these lithologies. Travertine deposits associated with many springs imply low reservoir temperatures or near-surface reequilibration with limestone. Precipitation of carbonates and flow of thermal waters through siliceous volcanic rocks and evaporites limit the use of silica or Na-K-Ca geothermometers. Recent igneous activity, though common in southern New Mexico, has not been documented in Trans-Pecos Texas and is an unlikely heat source for the thermal waters. Groundwater may be heated by deep circulation along faults in an area of high heat flow due to a thinned crust from late Cenozoic extension.

365. GGIS-100478/G/ / /C/ / / / /

Title- Geologic Structure Map On the Heterostegina-Marginulina Zone and Base of "Miocene" Horizon; Lower Rio Grande Embayment, Texas

(Plate 1)

Conference- Third Geopressured-Geothermal Energy Conference

Lafayette

LA (November 16, 1977)

Pagination- 1 Pages

Note- Minor modifications by J.B. Wesselman

Local Availability- GGIS

Sponsor- / Department of the Interior, United States Geological Survey /

Corporate Author- Peppard-Souders and Associates

Houston, TX

Descriptor(s)- / Cameron County / Contour maps / Faults / Geologic structures / Hidalgo County / Kenedy County / Maps / Rio Grande Embayment / Texas / Willacy County /

Abstract by GGIS

The geologic structure contours of the Heterostegina-Marginulina Zone and the base of the Miocene Horizon in the Lower Rio Grande Embayment (Texas) are shown on this map. The structural control is based on information available as of September 4, 1973. The scale of the map is 1:192,000.

366. GGIS-100554/R/ / /M/ / / / /

Title- Geologic Studies of Geopressured and Hydropressured Zones in Texas

Subtitle- Supplementary Tasks

Author(s)- / Weise , B.R. / Jirik , L.A. / Hamlin , H.S. / Hallam , S.L. / Edwards , M.B. /

Publication date- August 1981

Pagination- 134 Pages

Report/patent- PB82-200619

Available- NTIS

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRI-5011-321-0125 /

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin , USA

Descriptor(s)- / Aquifers / Dissolved gases / Engineering geology / Frio Formation / Gases / Geological setting / Geology / Geopressured zones / Gulf Coast / Texas / Vicksburg Formation / Wilcox Formation /

Abstract by NTIS

The potential for producing solution gas from shallow geopressured and deep hydropressured aquifers was assessed for the Frio, Vicksburg, and Wilcox sandstone trends of the Texas Gulf Coast. Geological and engineering studies of prospect areas show that below the top of geopressure, sandstones are generally thinner, permeabilities are lower, and fault density is greater, but there is no appreciable difference in these parameters between the shallow and deep geopressured sediments. Extant test data indicate that some geopressured aquifers produce free gas in addition to solution gas. Consequently, hydrocarbon-to-water ratios in both shallow and deep aquifers are comparable and less than 40 SCF/bbl.

367. GGIS-100418/R/ / /M/ / / / /

Title- Geologic Studies of Geopressured and Hydropressured Zones in Texas

Subtitle- Annual Report, Jan 79 - Jan 80

Author(s)- / Morton , R.A. / Weise , B.R. / Gregory , A.R. /

Publication date- January 30 , 1980

Pagination- 54 Pages

Report/patent- PB80-219611

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRI-5011-321-0125 /

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin , USA

Descriptor(s)- / Aquifer tests / Fairway analysis / Frio Formation / Geological surveys / Geopressure exploration / Geopressured

Geopressured Geothermal Bibliography

zones / Gulf Coast / Hydropressure / Methane / Natural gas
deposits / Pressure gradients / Reservoir rocks / Resource
assessment / Sand trends / Sandstone / Site selection /
Temperature surveys / Tertiary Period / Texas / Wilcox Formation
/

Abstract by TIC

During 1979, zones within the geopressured and deep hydro pressured section of the Texas Gulf Coast Tertiary were defined on the basis of pressure gradients and temperatures. High-sandstone corridors, corresponding to the trends of the Wilcox group and Frio Formation, were identified for the geopressured and deep hydro pressured zones. Five fairways, or areas of maximum sandstone, were located within the corridors. Areas most prospective for testing entrained methane resources in the shallow geopressured and deep hydro pressured zones were identified in each fairway.

368. GGIS-100024/B/ / 11/A/ / / / /

Title- Geological Aspects of Abnormal Reservoir Pressure in Gulf Coast Louisiana
(Paper 1 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)

Author(s)- / Dickinson , George B. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 11 , 1974

Pagination- Page 4 , 23 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Louisiana / Petroleum / Economic geology / United States / Gas / Iberia Parish / Cameron Parish / Weeks Island / Chalkley Field / Production / Reservoir rocks / Oil and gas fields / Geopressure / Lithofacies / Stratigraphy / Structure / Tertiary /

Abstract by Author

High-pressure zones commonly make drilling of wells most difficult in a belt about 50 miles wide along the coastal plain northwest of the Gulf of Mexico from the Rio Grande to the Mississippi Delta. This study is an attempt to link geological factors with occurrences of abnormal pressure in order to provide a better understanding of their origin. Dangerously abnormal pressures occur commonly in isolated porous reservoir beds in thick shale sections developed below the main sand series. Their locations are controlled by the regional facies change in the Gulf Coast Tertiary province, and they appear to be independent of depth and geological age of the formation. The high pressures are caused by compaction of the shales under the weight of the overburden which is equivalent to approximately one pound per square inch per foot depth. Difference in density between gas and water causes abnormal pressure where hydrocarbon accumulations occur above water, irrespective of whether the water is at normal or abnormal pressures. The magnitude of this pressure depends on the structural elevation above the source of pressure in the water and may cause very high pressure gradients in isolated sand bodies. However, the trend of pressures in the Gulf Coast region indicates that maximum pressures probably do

not exceed 90 per cent of the overburden pressure. The abrupt increase in pressure above normal hydrostatic pressure commonly occurs over a very short vertical interval which makes control difficult. Successful drilling through abnormal pressures involves cementing casing below the main sand series and above the high pressure zones so that heavy mud may be used without loss of circulation.

369. GGIS-100393/0/ / /A/ / / / /

Title- Geological Aspects of Pleasant Valley Geopressured Geothermal Test Well, Austin Bayou Prospect, Brazoria County, Texas

Author(s)- / Bebout / Don G. / Loucks , Robert G. / Gregory , A. Ray /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 1 , June 1980

Pagination- Page 11 , 35 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

78712

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA) Div. of Geothermal Energy

DE-AC08-79ET-27111 /

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin , TX , USA

Auxiliary expression(s)-

Illus. / Diagram (9) / Graph (1) / Map (10) / Figure (1) /

Table

Ref.

Descriptor(s)- / Areal geology / Brazoria County / Exploratory wells / Fairway analysis / Frio formation / Geologic structures / Geopressured wells / Geopressured zones / Methane / Pleasant Bayou No. 1 well / Pleasant Bayou No. 2 well / Sandstone / Well characteristics /

Abstract by Author

Regional geological studies of the Frio Formation in Texas resulted in the delineation of several geothermal fairways which contain thick sandstones with fluid temperatures greater than 300 DEG F (149 DEG C); additional studies of these fairways indicated that only one of these, the Brazoria Fairway, contained sandstones with permeabilities greater than the 20 md required to produce fluids at high rates needed for a successful geothermal well. Through further detailed mapping, the Austin Bayou Prospect was identified within the fairway, and a test-well site area was outlined within this prospect. The prospective sandstones at the top of seven progradational cycles occur below the T5 marker of the lower Frio Formation. In the original test-site proposal (Bebout, Loucks, and Gregory, 1978) the T5 marker was projected by BEG to occur at 14,000 ft (4,267

Geopressured Geothermal Bibliography

m) below sea level; it is also below this depth that subsurface fluid temperatures exceed 300 DEG F (149 DEG C). It was also predicted that there would be 840 ft (256 m) of net sandstone and that 30 percent would have permeabilities higher than 20 md in the test-site area. At the actual test-well site, 1.75 mi (2.8 km) northeast of the original site, the T5 marker was projected at 13,600 ft (4,145 m) below sea level and 690 ft (210 m) of sandstone was expected below T5. The Department of Energy and General Crude Oil (GCO/DOE) No. 2 Pleasant Bayou well drilled on the actual test-well site to a total depth of 16,500 ft (5,029 m) encountered the T5 marker at 13,960 ft (4,255 m) indicating a slightly steeper dip into the salt-withdrawal basin than originally predicated. A total of 660 ft (201 m) of net sandstone is present beneath the T5 marker, slightly less than the 690 ft (210 m) expected. Present perforations are in the fluvial sandstones of the C, D, and E depositional cycles. Methane solubility of formation waters below the T5 marker is expected to be between 28 and 31 ft³/bbl based on BHSIP data from drill stem tests, salinity analyses of water samples, and equilibrium borehole temperatures. Calculations assume that waters are saturated with methane.

370. GGIS-100575/R/ / /M/ / / / /

Title- Geological Implications of Geopressured-Geothermal Energy Development

Subtitle- Texas-Louisiana Gulf Coast Region

Author(s)- / Gustavson, T.C. / McGraw, M.M. / Tandy, M. / Parker, F. / Wohlchlag, D.E. /

Publication date- 1978

Pagination- 227 Pages

Report/patent- FWS/OBS-78/60

Note- Also contains a 250-page appendix

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin, USA

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Ecology / Energy source development / Environmental impact statements / Gulf Coast / Louisiana / Regional analysis / Resource development / Texas /

371. GGIS-100338/R/ / /M/ / / / /

Title- Geological, Geophysical and Engineering Investigation to Evaluate the Potential of the Geothermal-Geopressured Reservoir in Section 30, T15S-R17E, La Fourche Parish, Louisiana

Subtitle- Final Report

Author(s)- / Eaton, B.A. /

Publication date- April 1979

Pagination- 55 Pages

Report/patent- DOE/ET/27129-T1

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

AC08-79ET27129 /

Corporate Author- Eaton Industries of Houston, Inc.

Houston, Texas, USA

Descriptor(s)- / Engineering geology / Fault systems / Geologic structures / Drilling / Geopressured reservoirs / Geopressured wells / LaFourche Parish / Louisiana / Maps / Reservoir pressure / Reservoir temperature / Salinity / Seismic surveys / Site selection / Stratigraphy / Flow rate /

Abstract by TIC

The potential for drilling a well and encountering a geopressure section capable of yielding large quantities of fluids for a two-year flow test is explored. Tabulations, geologic cross sections, geologic maps, and drilling recommendations are included. Interpretations of seismic data and well information are included with geologic cross sections through the recommended drill site area showing fault locations, reservoir sands, and other pertinent facts concerning the well site subsurface structure.

372. GGIS-100107/R/ / /M/ / / / /

Title- Geology and Potential Uses of the Geopressure Resources of the Gulf Coast

(6,000 MW-Centuries of Recoverable Electric Energy, 200 TCF of Methane)

Author(s)- / Howard, H. H. / House, P. A. / Johnson, P. M. / Towse, D. F. / Bebout, D. G. / Dorfman, M. H. / Agagu, O. K. / Hornburg, C. D. / Morin, D. J. /

Publication date- June 1976

Pagination- 23 Pages

Report/patent- UCID--17163

Available- NTIS

(Paper copy)

(Microform)

Sponsor- / ERDA

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Livermore Laboratories

Livermore, California, USA

Descriptor(s)- / Coastal regions / Geopressured systems / Geothermal energy conversion / Geothermal resources / Gulf of Mexico / Heat / Methane / Power potential / Processing / Recovery processes / Texas / Geothermal power plants / USA /

Abstract by ERDA/RECON

The U. S. ERDA has supported efforts to evaluate the potential contribution to the national energy supply of geopressured geothermal resources in the Gulf Coast. Efforts include a program of resource assessment and programs to examine utilization of the resource for the production of electricity and as a source of industrial-process heat. Work on resource assessment has suggested the presence of perhaps as much as 6,000 MW-centuries of recoverable electric energy and of 200 TCF of methane. This program has emphasized finding significantly

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large sand bodies within the geopressured stratigraphic section in addition to defining the distribution of abnormal fluid pressures and formation temperatures. Regional sand facies analyses conducted thus far indicate five locations in the Frio Formation of central and south Texas where adequately large geopressured geothermal resources may be present. Engineering studies of energy-conversion systems based on total-flow, flashed-steam, and binary-cycle concepts show that development of electric power from the Gulf Coast geopressure resource is technically feasible. Study of use of the resource as process heat in pulp and paper mills and new sugar refineries has shown that these uses also are technically sound. The thermal content of a barrel of geothermal brine can cost as little as 9 mills when credited for recoverable hydraulic energy and methane. The value of heat approaches 50 mills per BBL for certain applications. All programs have pointed out clearly the need for better specific understanding of the resource, especially its dissolved methane content and its ability to produce for tens of years.

373. GGIS-100023/J/ / 6004/A/ / / / /

Title- Geology and Potential Uses of Geopressure Resources of Gulf Coast

Author(s)- / Howard , J. H. / House , P. A. / Johnson , P. M. /
Publisher- American Association of Petroleum Geologists
Journal- American Association of Petroleum Geologist Bulletin
Publication date- Vol. 60 , Issue 4 , 1976
Pagination- Page 682
Descriptor(s)- / Gulf Coast / Economic geology / Energy sources /
Geothermal energy / United States / North America / Geopressure /
Resources / Uses / Exploration / Production / Technology /
Economics / Programs / Reviews / ERDA /

374. GGIS-100528/O/ / /A/ / / / /

**Title- Geology of the Cib Jeff Geopressured Sand
(Addendum)**

Author(s)- / Hamilton , Jack /
Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)
Publication date- 1981
Pagination- 14 Pages
Local Availability- GGIS
Local Availability- CES
Auxiliary expression(s)-
Illus. / Figure (2) / Map (3) /
Table
Descriptor(s)- / Geology / Geopressured wells / L.R. Sweezy No.1 Well / Louisiana / Permeability / Porosity / Sandstone / Well testing /

Abstract by GGIS

The Parcperdue Field Cib jeff sand reservoir exists at a depth of 13,340 ft. and is bound vertically by shale of marine

origin, and laterally by well defined faulting. The sand represents a barrier bar environment of deposition and is highly porous and relatively unconsolidated. The reservoir's limited size will permit significant pressure depletion over a production period of several months. The Dow-DOE No. 1 Sweezy was drilled to a T.D. of 13,600 ft and logged. The Cib jeff sand and underlying shale interval were cored and studied for lithologic description, rock mechanical properties, porosity and permeability, sieve analysis, thin-section petrography, scanning-electron micrography, and organic geochemistry of the shale.

375. GGIS-100528/O/ / /A/ / / / /

Title- Geology of the Sweet Lake Prospect, Cameron Parish, Louisiana
Subtitle- An Update
Author(s)- / Hoffman , K.S. / Durham , C.O. /
Conference- Fifth Conference on Geopressed-Geothermal Energy (October 13 , 1981)
Publication date- 1981
Pagination- Page 299 , 4 Pages
Local Availability- GGIS
Local Availability- CES
Sponsor- / Department of Energy, Washington, D.C. (USA)
 DE-AC08-80NV10081 /
Auxiliary expression(s)-
 Illus. / Figure (1) / Map (1) / Photo (2) /
 Table
 Ref.
Descriptor(s)- / Cameron Parish / Frio Formation / Geology / Louisiana
 / Oligocene Epoch / Permeability / Porosity / Sand /
Abstract by Author

The Sweet Lake Prospect is located in a basin southeast of Lake Charles, Louisiana. The prospective sand is the Miogypsinoides ("Miogyp") sand of the Frio Formation of Upper Oligocene age, which is found at a depth of 15,000-15,640' in the test well. Porosity and permeability in one of the sands in the sequence are 24 percent and 3,600 md, respectively. Sands are medium to fine grained and consist of 75 percent quartz, 19 percent feldspar, and 6 percent clays. The cementing material is quartz overgrowth; the clays are very fine hairs present in the pore spaces. Initial reservoir conditions are 299 deg F and 12,060 psi. Salinity of the brine is 140,000 ppm, and the gas content is 11-13 SCF/B.

376. GGIS-100224/B/ / /M/ / / / /

Title- Geology of Alternate Energy Resources in the South-Central United States
Author(s)- / Campbell , Michael D. /
Publisher- Houston Geological Society
 Houston, Texas
Publication date- 1977
Pagination- 379 Pages

Geopressured Geothermal Bibliography

Available- Geothermal Information Services

318 Cherrywood St.

West Covina

CA

91791)

Descriptor(s)-- / Energy source development / Environmental effects /
Exploration methods / Geothermal exploration / Geothermal
resources / Lignite / Louisiana / Texas / Uranium / Uses /

Abstract by TIC

Uranium, lignite, and geothermal resources of the South-Central United States are considered from four aspects: frontier exploration and exploration techniques, trend areas and exploration techniques, resources development and utilization, and environmental consideration. A separate chapter is devoted to an extensive bibliography for each alternative energy source. Separate abstracts were prepared for each chapter. (JSR)

377. GGIS-100528/O/ / /A/ / / / /

Title- Geometry and Reservoir Heterogeneity of Tertiary Sandstones

Subtitle--A Guide to Reservoir Continuity and Geothermal Resource Development

Author(s)-- / Morton, Robert A. / Ewing, Thomas E. /

Conference-- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date--1981

Pagination--Page 7, 4 Pages

Local Availability--GGIS

Local Availability--CES

Sponsor-- / Department of Energy, Washington, D.C. (USA)

DE-AC08-79ET27111 /

Auxiliary expression(s)--

Illus. / Figure (4) /

Table

Ref.

Descriptor(s)-- / Aquifers / Compaction / Geologic structures /
Geopressured reservoirs / Gulf Coast / Physical properties /
Sandstone / Tertiary period / Volume /

Abstract by Author

External and internal continuity of Tertiary sandstones are controlled by various factors including structural trends, sand body geometry, and the distribution of mineral framework, matrix, and interstices within the sand body. Except for the limits imposed by faults, these factors are largely inherited from the depositional environment and modified during sandstone compaction and cementation. Sandstone continuity affects energy exploration and production strategies. The strategies range in scope from regional to site-specific and closely parallel a sandstone hierarchy. The hierarchy includes subdivisions ranking from genetically related aquifer systems down to individual reservoirs within a fault-bounded sandstone. Volumes of individual reservoirs are 50 percent less to 200 percent more than estimated from conventional geologic mapping. In general, mapped volumes underestimate actual volumes where laterally continuous shale breaks cause reductions in porosity and

permeability. Gross variations in these pore properties can be predicted on the basis of internal stratification and sandstone facies. Preliminary analyses indicate that large aquifers are found where barrier and strandplain sandstones parallel regional faults or where fluvial (meandering) channels trend normal to regional faults. Within these sand bodies, porosity and permeability are highest in large-scale crossbedded intervals and lowest in contorted, bioturbated, and smallscale ripple cross-laminated intervals.

378. GGIS-100374/O/ / /A/ / / / /

Title- Geophysical Methods in Reservoir Engineering and Reservoir Management

(2. Session: EPRI Project Reports)

Author(s)- / Meidav , Tsvi /

Conference- 3rd Annual Geothermal Conference and Workshop Proceedings
Monterrey
California

USA (June 26 , 1979)

Publisher- Electric Power Research Institute
Palo Alto, California

Publication date- October 1979

Pagination- Page 31 , 7 Pages

Report/patent- EPRI-WS-79-166

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (1) / Figure (1) /

Table

Ref.

Descriptor(s)- / Exploitation / Forecasting / Geophysical surveys /
Geothermal wells / Measuring methods / Monitoring / Reservoir
engineering / Reservoir properties / Resource assessment /

Abstract by Author

Economic pressures will always militate for the development of each discovered reservoir to its ultimate capacity, provided that the reservoir does not decline to sub-economic pressure, temperature and flow before the power plant has reached its ultimate design life, which is typically taken as 30 years. The reservoir manager must call upon a variety of both standard and exotic geoscientific methods which assist in estimating the ultimate reservoir capacity. In doing that, the reservoir manager must detect changes in any of the parameters which have been employed in the simulation forecast, and modify his forecast accordingly. Management must be advised as far ahead in advance as possible should current monitoring indicate that the reservoir is likely to decline at a rate faster than anticipated, so that proper responses are formulated and acted upon. Various methods may be employed to provide a prediction of reservoir characteristics and their changes over time. These techniques may be employed for estimation of reservoir volume, temperature, changes in volume and temperature, and other characteristics, in the three distinct phases of reservoir exploration and utilization: (a) pre-drilling exploration, (b) during drilling, and (c) during field exploitation. This paper discusses those

Geopressured Geothermal Bibliography

techniques which are related to reservoir monitoring during field exploitation.

379. GGIS-100996/ / / /A/ / / / /

Title- Geopressure in Houma and Hollywood Fields, Louisiana

Author(s)- / Mumme, S.T. / Ferrell, R.E. Jr. /

Conference- Gulf Coast Asso. of Geological Societies 29th Annual Meeting
San Antonio
Texas

USA (October 10 , 1979)

Publication date- Vol. 63 , Issue 9 , 1979

Pagination- Page 1609 , 1 Pages

Note- Abstract only of a paper presented at the 29th annual meeting, Gulf Coast Association of Geological Societies and the Gulf Coast Section, Society of Economic Paleontologists and Mineralogists, San Antonio, Texas, October 10-12, 1979

Corporate Author- Louisiana State Univ., Baton Rouge
Baton Rouge, Louisiana, USA

Descriptor(s)- / Elevated temperature / Fluid flow / Gas production / Geopressured zones / Growth faults / Leakage / Lost circulation / Louisiana / Resource assessment / Salinity /

Abstract by Document

The Houma and Hollywood fields comprise one of the largest gas and gas-condensate producing areas in Louisiana. Three zones, the hydrogeopressured Bigenerina humblei and Krumbhaar sands and the geopressured Southdown-Hollywood sands, are responsible for estimated ultimate recoveries of 30 million bbl of condensate and 2.5 Tcf on nonassociated gas. The Hollywood shale forms a geopressure seal 1,200 to 2,000 FT (360 to 600 M) thick over most of the area. Pressure differentials between the Krumbhaar and Southdown-Hollywood sands range from 3,700 to 7,200 PSI (25,512 to 49,644 kPa). The Houma-Hollywood field area is from the geopressured zone. The higher than normal temperatures and low salinities at the base of the hydrogeopressured zone provide evidence for this proposed leakage. The routes of fluid escape are numerous and are associated with the large growth faults of the area. The fluid escape paths are identified by the use of structure, temperature, and salinity maps. The absence of deep wells in parts of the study area and the uncertainties of the log-derived temperatures and salinities may produce some uncertainties in the interpretations. However, our observations are consistent with predictions based on the present theories concerning geopressure processes.

380. GGIS-100284/R/ / /A/ / / / /

Title- Geopressure Blowout Control

(Book 2)

Subtitle- Phase I: Study of Existing Technology

Author(s)- / Rehm, William A. / Goins, W.C., Jr. /

Journal- A Study of Technology in Well Control for Geothermal and Geopressured Wells

Publication date- November 1978

Pagination- 99 Pages

Report/patent- IDO-1603-1

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Auxiliary expression(s)-

Illus. / Figure (35) /

Ref.

Descriptor(s)- / Blowout preventers / Blowouts / Bottom Hole Pressure / Depth / Drilling equipment / Erosion / Drilling / Geopressured wells / Geopressured zones / Hazards / Reservoir pressure / Reservoir temperature / Safety / Water production /

Abstract by Author

Geopressure drilling is hazardous because of the pressures and gas that will be encountered. The hazard is compounded by the great depth of the wells and the difficulty in properly interpreting the well conditions. The present state-of-the-art provides no guaranteed safe and assured manner to drill the very high pressured geopressured well. Safeguards do exist that reduce the hazard to what has been economically acceptable. The equipment, techniques, and guidelines that have been developed for drilling into high pressure and geopressured drilling for high pressured oil and gas fields. Equipment to detect the potential blowout in its earliest stages is unreliable and needs improvement. The standards on well-control equipment do not encompass the higher temperatures postulated for geopressure water and gas production and so the temperature limits need to be examined. The real key to geopressure drilling lies in well site supervision and well programming. These are harder to grasp problems than equipment limitations, but the pressures from the geopresured well are so great (10,000 to 20,000 PSI) and the problem of sand erosion of equipment is severe, that the geopressure well must be controlled at all times.

381. GGIS-100284/R/ / /A/ / / / /

Title- Geopressure Blowout Control

(Book 4)

Subtitle- Phase II: Program Plan for Geopressure Blowout Control

Author(s)- / Rehm , William A. / Goins , W.C., Jr. /

Journal- A Study of Technology in Well Control for Geothermal and Geopressured Wells

Publication date- November 1978

Pagination- 18 Pages

Report/patent- IDO-1603-1

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Auxiliary expression(s)-

Illus. / Figure (1) /

Table

Geopressured Geothermal Bibliography

Descriptor(s)- / Blowouts / Cost / Cost benefit analysis / Detection /
Drilling fluids / Equipment / Drilling / Geopressured wells /
Hazards / Personnel / Reservoir pressure / Reservoir temperature
/ Safety / Well casings / Well drilling /

Abstract by Author

A safe and assured geopressure drilling program is at the very edge of the state-of-the-art and to assure the safe drilling of the extremely hot, deep, and pressured well requires strong supervisory control and improved detection equipment. Geopressure drilling is hazardous because of the extreme pressures and the presence of flammable gas. It is difficult on paper to explain the relative paradoxes of dealing with a geopressured well. Despite the difficulty of interpreting the conditions deep in the ground, the geopressured well can be kept under control by the mud system in conjunction with a good casing program. Even if the well kicks, it can be controlled in a simple and straight forward manner. However, an error in judgment or equipment that malfunctions at a critical moment can cause situations that are difficult to analyze and control. The drilling personnel are the real key to avoiding blowouts. The following report on the Development Program for Geopressure Well Control reflects the importance of the people in the first series of recommendations. These indicate the training and information that are paramount to avoiding blowouts. Further recommendations suggest that the detection equipment be made more reliable and that the unknown condition of the blowout control equipment under conditions of temperature and pressure be examined. Finally the recommendation is made that a procedures and operations guide be made available to the Federal personnel and their contractors. Recommended total expenditures for a basic program over a five year period are \$790,000. This budget and time will provide for the development, demonstrations, and technology transfer for improved geopressure blowout control procedure and equipment. Savings in excess of 90 times the cost of the program can be expected from the outlined program.

382..GGIS-100283/R/ / /M/ / / / /

Title- Geopressure Energy Resource Evaluation

Author(s)- / Samuels , Garland /

Publication date- May 1979

Pagination- 72 Pages

Report/patent- ORNL/PPA--79/2

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

W-7405-eng-26 /

Corporate Author- Oak Ridge National Lab.

Oak Ridge , Tennessee , USA

Auxiliary expression(s)-

Illus. / Map (4) / Graph (7) /

Table

Appendix

Ref.

Descriptor(s)- / Aquifers / Compressibility / Cost / Economics / Exploitation / Flow rate / Geopressured reservoirs / Gulf of Mexico / Louisiana / Low temperature / Methane / Mexico / Natural gas / Permeability / Resource assessment / Texas / Water production / Well completion / Well spacing /

Abstract by Author

The geopressured aquifers that extend along the northern Gulf of Mexico are a large, perhaps the largest, potential source of geothermal energy and natural gas in the United States. Because of the high cost of completing wells into these formations and their relatively low temperatures (200 to 400 DEG F), the utilization of the geothermal energy will be highly dependent on, and of secondary importance to, the value of the methane. The economics of extracting either the geothermal energy or natural gas from these aquifers does not look promising. The combined requirements of high well flow rates (40,000 bbl/day, long life (20 years), and the necessity for close well spacing to minimize the cost of the collection system may be incompatible with the actual characteristics of the reservoirs. These factors place such stringent requirements on the reservoir size, permeability, and compressibility, or specific storage coefficient, that the number of promising production areas may be severely limited.

383. GGIS-100528/O/ / /A/ / / / /

Title- Geopressure Geothermal Energy Conversion

Subtitle- The Supercritical Propane Cycle for Power Generation

Author(s)- / Goldsberry, Fred L. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 137, 7 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (2) /

Table

Ref.

Descriptor(s)- / Geothermal power plants / Geothermal resources / Power generation / Production rate / US DOE / Wells /

Abstract by Author

The development of the geopressure geothermal unconventional gas resource has been the object of a drilling and reservoir testing program conducted by the U.S. Department of Energy. One aspect of the assessment has been to look at the geothermal component of the energy base as a source of power generation. The basic production unit for the resource has been estimated to be a well capable of producing fluid at a rate of 15,000 - 40,000 BPD at temperatures of 240-360 deg F (.0276 - .0736 M ** 3/ sec at 338-455 deg K). The spacing of these wells will be approximately 2-4 km for effective reservoir drainage. This limits the generation capacity, per well from 700-3,000 kW per site. For purposes of this paper it is assumed that interconnecting pipelines to carry brine from each well to a

Geopressured Geothermal Bibliography

central location and then return it to salt water disposal wells will be impractical. Single well power plants with electrical gathering systems are considered to be the probable mode of development.

384. GGIS-100053/J/ / /A/ / / / /

Title- Geopressure Magnitude Determination Using a Graphical Method
Author(s)- / Eaton, B.A. /
Publication date- Vol. 29 , Issue 4 , 1977
Pagination- Page 404
Descriptor(s)- / Geopressure / Graphical methods / Rock properties /

385. GGIS-100299/J/ / /A/ / / / /

Title- Geopressure Zones Studied as Potential Energy Source
Publisher- Twin Coast Newspapers, Inc.
 New York, NY
Journal- J. Commerce
Publication date- Vol. 332 , Issue 2392 , April 5 , 1977
Pagination- Page 9 , 1 Pages
Descriptor(s)- / Geopressured wells / Geopressured zones / Geothermal
 brines / Louisiana / Natural gas wells / Sand production / Water
 production /
Abstract by PROMPT
Geopressure zones are potential energy sources. Researchers are conducting experiments on a south Louisiana gas well to test a theory that vast pools of hot, pressurized underground water contain enough gas to dwarf any discovery in the US to date. The well will tap a geopressure zone 12,000 feet deep, according to Dr. O. C. Karkalits, dean of the engineering school at McNeese State University (Lake Charles, La.). The test will determine how much gas is contained in the pressurized water in the zone and if producing the water will cause sand in the underground formation to flow into the well pipe and plug it. The project is being sponsored by ERDA.

386. GGIS-100393/O/ / /A/ / / / /

Title- Geopressured Aquifer Simulator
Author(s)- / Byrnes, Alan P. / Rockar, Evelyn M. / Randolph, Phillip L. / Kelkar, Sharad M. /
Publisher- 4th Geopressured Geothermal Energy Conference
Publication date- Vol. 2 , June 1980
Pagination- Page 933 , 27 Pages
Available- Center for Energy Studies
 University of Texas at Austin
 ENS
 Austin
 TX
 78712
 (Paper copy)

Local Availability- CES

Sponsor- / Brooklyn Union Gas Co., NY (USA)

Sponsor- / Columbia Gas System Service Corp., Wilmington, DE (USA)

Sponsor- / Consolidated Natural Gas Service Co., Inc., Cleveland, OH (USA) /

Corporate Author- Institute of Gas Technology
Chicago, IL, USA

Auxiliary expression(s)-

Illus. / Diagram (2) / Photo (1) /

Ref.

Descriptor(s)- / Aquifers / Brines / Compaction / Compression / Core analysis / Geopressed reservoirs / Laboratory equipment / Laboratory testing / Methane / Permeability / Reservoir properties / Simulation / Solubility /

Abstract by Author

Ten natural gas companies have funded the Institute of Gas Technology (IGT) development of a laboratory facility for fluid and core analyses at temperatures and pressures characteristic of geopressed aquifers. The facility has been designed and constructed to measure the following parameters at pressures up to 20,000 psi and temperatures to 450 DEG F: (1) solubility of methane in brines from actual geopressed aquifers; (2) dependence of compression and compaction reservoir drive upon pressure; (3) dependence of permeability upon reservoir pressure and temperatures; (4) dependence of relative permeabilities to gas and to water upon the water saturation of pores, pressure, and temperature. Brine pumped through the core can be either gas-free or from a reservoir of brine with gas in solution. The facility is modular in design with major components-- including the reservoir of gas-saturated brine, high-pressured, high-temperature brine are fabricated from holder--housed in a large oven. All components constructed by high-pressure, high-temperature brine are fabricated from Hastelloy C-276, Elgaloy, or Inconel 625 to avoid corrosion. The temperatures, pressures, differential pressure, and flow rates are controlled and/or recorded by a digital microcomputer/microprocessor. Operation will be controlled from a separate room and programmed; hands-off operation will be the normal mode of operation. The facility has been constructed and is now being tested. Following performance testing with Berea sandstone, initial emphasis will be upon studies of brine and available core from DOE's Pleasant Bayou No. 1 and No. 2 wells.

387. GGIS-100273/J/ / /A/ / / / /

Title- Geopressed Aquifers--

Subtitle- A New Source of Natural Gas?

Author(s)- / Bernard, William J. /

Journal- Panhandle Mag.

Publication date- Issue 2, 1978

Pagination- Page 13, 8 Pages

Auxiliary expression(s)-

Illus. / Diagram (9) / Map (1) /

Descriptor(s)- / Aquifers / Binary cycle power generation / Direct energy utilization / Economics / Energy transfer / Environmental

Geopressed Geothermal Bibliography

effects / Geology / Drilling / Geopressed zones / Gulf Coast /
Legal aspects / Natural gas / Texas / Louisiana /

Abstract by Energyline

The potential of geopressed aquifers to yield natural gas has received much publicity lately. The geologic basin along the Gulf of Mexico contains subsurface geopressed formations. The geological development of such aquifers is reviewed. Energy can be recovered from these formations in the form of hydraulic and thermal power, and natural gas. However, special equipment will have to be designed to recover the energy. Possibilities for using the energy include direct use of the heat, conversion in a binary engine, or extraction of the dissolved natural gas. Legal, environmental, and transportation problems are listed. The economic feasibility of this resource must be determined.

388. GGIS-100542/R/ / /M/ / / / /

Title- Geopressed Brines

Publication date- 1980

Pagination- 191 Pages

Note- Vol. IV of Unconventional Gas Sources Series

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA) /

Corporate Author- National Petroleum Council

Washington, D.C. , USA

Auxiliary expression(s)-

Illus. / Diagram (6) / Graph (60) / Map (7) /

Ref.

Table

Descriptor(s)- / Brines / Comparative evaluations / Data / Economic analysis / Environmental effects / Geology / Geopressed reservoirs / Gulf Coast / Legal aspects / Louisiana / Production / Recovery processes / Reservoir engineering / Risk assessment / Tertiary period / Texas /

Abstract by GGIS

The National Petroleum Council study reports on gas recovery from geopressed brine reservoirs of the Tertiary age in the Texas and Louisiana Gulf Coast onshore areas. It examines the geology of the region to identify and study in detail prospects for development. Some conclusions indicate that although commercial production of gas from geopressed brines is possible, certain factors, including current high capital investment requirements, mechanical and geological risk factors, and low recovery efficiency, make it unlikely on a large scale before the year 2000.

389. GGIS-100580/R/ / /M/ / / / /

Title- Geopressed Energy Availability

Publication date- September 1980

Sponsor- / Electric Power Research Inst., Palo Alto, CA (USA).

Advanced Power Systems Division /

Corporate Author- Southwest Research Inst.

San Antonio , TX , USA

Descriptor(s)- / Electric potential / Energy yield / Geopressure /
Geopressure resources / Gulf Coast / Louisiana / Power
generation / Productivity / Texas /

390. GGIS-100419/R/ / /M/ / / / /

Title- Geopressured Energy Availability

Subtitle- Final Report
Publication date- June 1980
Pagination- 136 Pages
Report/patent- EPRI-AP-1457
Available- NTIS

{ Paper copy }
{ Microfiche }

Local Availability- CES

Sponsor- / Electric Power Research Inst., Palo Alto, CA (USA) /

Corporate Author- Southwest Research Inst.

San Antonio , TX , USA

Auxiliary expression(s)-

Illus. / Diagram (11) / Graph (46) / Map (10) /
Table
Ref.

Descriptor(s)- / Binary fluid systems / Economics / Energy source
development / Environmental impact / Feasibility studies /
Flashed steam systems / Flow rate / Geologic models / Geological
surveys / Geopressured systems / Geothermal brines / Geothermal
energy conversion / Louisiana / Methane / Performance / Power
generation / Reinjection / Reservoir engineering / Resource
assessment / Site selection / Statistical models / Technology
assessment / Texas /

Abstract by (Unknown)

Near- and long-term prospects that geopressured geothermal energy sources could become a viable alternative fuel for electric power generation were investigated. Technical questions of producibility and power generation were included, as well as economic and environmental considerations. The investigators relied heavily on the existing body of information, particularly in geotechnical areas. Statistical methods were used where possible to establish probable production values. Potentially productive geopressured sediments have been identified in twenty specific on-shore fairways in Louisiana and Texas. A total of 232 trillion cubic feet (TCF) of dissolved methane and 367×10^{15} Btu (367 quads) of thermal energy may be contained in the water within the sandstone in these formations. Reasonable predictions of the significant reservoir parameters indicate that a maximum of 7.6 TCF methane and 12.6 quads of thermal energy may be producible from these potential reservoirs.

391. GGIS-100062/J/ / /A/ / / / /

Title- Geopressured Energy Fighting Uphill Battle

Author(s)- / Kerr , Richard A. /

Publication date- Vol. 207 , Issue 28 , March 1980

Geopressured Geothermal Bibliography

Pagination- Page 1455 , 2 Pages

Local Availability- GGIS

Descriptor(s)- / Brazoria County / Edna Delcambre No. 1 Well /
Geopressure resources / Geopressured zones / Gulf Coast /
Louisiana / Methane / Natural gas deposits / Pleasant Bayou No. 2
Well / Research programs / Salinity / Sandstone / Solubility /
Texas / US DOE / Well drilling /

Abstract by GGIS

The possibility of using geopressured energy as a major energy source is debated. The most promising zones of development in Texas and Louisiana are discussed.

392. GGIS-100355/J/ / /A/ // //

Title- Geopressured Formation Parameters of the Armstrong and
Corpus Christi Fairways, Frio Formation (Oligocene), Central
and South Texas
(Paper no. GT-11)

Author(s)- / Dorfman , M. H. / Gregory , A. R. / Hainey , B. W. /
Ritchie , M. S. /

Publication date- Vol. 45 , Issue 4 , April 1980

Pagination- 1 Pages

Note- Abstract only of a paper presented at the 49th Annual
International Meeting and Exposition Society of Exploration
Geophysicists, New Orleans, Louisiana, Nov. 4-8, 1979

Local Availability- Geol.

Corporate Author- Texas Univ., Austin
Austin , Texas , USA

Descriptor(s)- / Acoustic measurements / Brazoria County / Elasticity
/ Geopressured wells / Sonic logging / Sound waves / Texas /

Abstract by Author

Digital waveform recordings were obtained from a long-spaced sonic logging tool in the Dept. of Energy geothermal well in Brazoria County, Texas. Analyses of these recordings are compared with conventional velocity logs, and with other logs obtained in this well and a second nearby well. Large (>20dB) variations observed in the amplitude of the P-wave are apparently due to lithologically controlled "coupling" variations. Direct interpretation of the sonic waveforms provides a basis for obtaining improved velocity logs in those sections where conventional sonic logs may be significantly in error due to waveform amplitude variations. In general, the long-spaced sonic log waveforms appear to provide considerable useful information regarding in-situ elastic properties which is not available from conventional logs. The expected reflecting properties of potential objective sands in the deep geopressure environment, and in shallower normal pressure environments, is discussed on the basis of this analysis.

393. GGIS-100002/0/ / 1/A/ // //

Title- Geopressured Gas Reservoir Performance in the Hollywood Field

Author(s)- / Atwater , G. I. /
Conference- Abnorm. Subsurf. Pressure

Baton Rouge
Louisiana
USA

Publication date- Vol. 1, Issue 1, 1967
 Pagination- Page 11, 7 Pages
 Descriptor(s)- / Gulf Coast / Economic geology / Natural gas /
 Hollywood Field / United States / Production / Geopressure /

 394. GGIS-100237/J/ / /A/ / / / /

Title- Geopressured Gas Resources Subject of A.G.A. Seminar

Journal- Am. Gas. Assoc. Mon.

Publication date- Vol. 60, Issue 9, September 1978

Pagination- Page 28, 2 Pages

Auxiliary expression(s)-

Illus. / Photo. (2) /

Descriptor(s)- / Commercialization / Gas production / Geopressure
 resources / Geopressured wells / Louisiana / Meetings / Methane /
 Research programs / Texas / Well drilling /

Abstract by GGIS

Significant commercial production of geopressured methane to supplement the nation's gas supply is not expected for at least 10 to 15 years. That was the consensus of opinion of the guest speakers at the American Gas Association's Seminar on Geopressured Gas Resources, June 13, 1978 in Arlington, Virginia. Commercial feasibility will depend largely upon solution of certain critical problems such as the ability to locate and drill reservoirs having suitable flow rates, temperatures, methane content and long-term productivity to justify further development; the determination that environmental problems (potential subsidence, satisfactory water disposal and resolution of thermal pollution effects) can be coped with successfully; and the resolution of legal barriers to geothermal development, including separation of geothermal and water rights, resolution of the horizontal divestiture problem and an accurate legal description of the resources. Results of field operations on test wells in Texas and Louisiana indicate that additional drilling is warranted.

 395. GGIS-100528/O/ / /A/ / / / /

Title- Geopressured Geothermal

Subtitle- A Multi-Energy Resource

Author(s)- / Karamchetty, Som D.S.R. / Liebowitz, Herman M. /
 Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 37, 5 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-81NV10174 /

Auxiliary expression(s)-

Illus. / Diagram (1) /

Geopressured Geothermal Bibliography

Table
Ref.

Descriptor(s)- / Cost / Economics / Energy source development /
Feasibility studies / Geothermal resources / Gulf Coast /
Louisiana / Recovery processes / Resource assessment /
Technology assessment / Technology utilization / Texas /

Abstract by Author

An innovative process for extracting energy from
geopressured-geothermal brine to meet multi-form energy
requirements is presented. Economical considerations are
addressed.

396. GGIS-100424/O/ / /A/ / / / /

Title- Geopressured Geothermal Commercialization

Subtitle- Four Mid-term Cameos

Author(s)- / Frederick , David O. / Prestwood , Donna C.L. / Roberts
/ Kenneth D. / Vanston , John H. /

Conference- Geothermal Resources Council 3rd Annual Meeting Trans.
(Expanding the Geothermal Frontier)

Reno

Nevada

USA (September 24 , 1979)

Publication date- Vol. 3 , 1979

Pagination- Page 229 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Corporate Author- Texas Univ.

Center for Energy Studies

Austin , USA

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Commercialization / Financial incentives / Fuel gas
/ Geopressure resources / Injection wells / Methane /
Petrochemical plants / Public utilities / Texas / Uses /

Abstract by Energyline

Four of the most probable patterns, or cameos, for
commercialization of geopressured geothermal energy are
discussed. The four cameos are: development of geopressured
resources as a feedstock and boiler fuel for petrochemical
companies; development of this resource to ensure boiler fuel
gas supply for gas transmission companies; development of
geopressured energy for integrated energy companies; and use of
geopressured methane as a boiler fuel for electric utilities.
Production of the resource for its methane content is
instrumental to each cameo.

397. GGIS-100424/O/ / /A/ / / / /

Title- Geopressured Geothermal Commercialization

Subtitle- Current Government Initiatives
 Author(s)- / Frederick , David O. / Prestwood , Donna C. / Roberts ,
 Kenneth D. / Vanston , John H. /
 Conference- Geothermal Resources Council 3rd Annual Meeting Trans.
 (Expanding the Geothermal Frontier)
 Reno
 Nevada
 USA (September 24 , 1979)
 Publication date- Vol. 3 , 1979
 Pagination- Page 225 , 4 Pages
 Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 CA
 95616

Corporate Author- Texas Univ.
 Center for Energy Studies
 Austin , USA

Descriptor(s)- / Commercialization / Financial incentives / Financing
 / Geopressure resources / Government policies / Legislation /
 Methane / Taxes /

Abstract by Energyline

Governmental initiatives affecting commercialization of
 geopressed geothermal resources are different from initiatives
 affecting commercialization of other geothermal resources.
 These differences are primarily a function of the great depth and
 methane component of the geopressed resource. Several aspects
 of DOE's geothermal loan guaranty program and recent energy
 legislation are discussed. Subject to certain limitations,
 DOE's loan program will guaranty as much as 75% of the cost of a
 geothermal project. The Energy Tax Act of 1978 provided several
 federal tax incentives to producers and users of geothermal
 energy and to producers of geopressed methane. Other tax
 incentives applicable to geopressed methane are reviewed.

398. GGIS-100504/R/ / /M/ / / / /

**Title- Geopressed Geothermal Drilling and Completions Technology
 Development Needs**

Author(s)- / Maish , A. B. /

Publication date- March 1981

Pagination- 119 Pages

Report/patent- SAND-81-0021

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC04-76DP00789 /

Corporate Author- Sandia Labs.

Albuquerque , NM , USA

Descriptor(s)- / Brines / Economics / Energy source development /
 Exploratory wells / Geopressed systems / Gulf Coast /
 Louisiana / Natural gas / Technology assessment / Texas / Well
 design / Well drilling / Well logging /

Abstract by NTIS

Geopressured Geothermal Bibliography

Geopressured geothermal formations found in the Texas and Louisiana Gulf Coast region and elsewhere have the potential to supply large quantities of energy in the form of natural gas and warm brine (200 to 300 exp 0 F). Advances are needed, however, in hardware technology, well design technology, and drilling and completion practices to enable production and testing of exploratory wells and to enable economic production of the resource should further development be warranted. This report identifies needed technology for drilling and completing geopressured geothermal source and reinjection wells to reduce the cost and to accelerate commercial recovery of this resource. A comprehensive prioritized list of tasks to develop necessary technology has been prepared. Tasks listed in this report address a wide range of technology needs including new diagnostic techniques, control technologies, hardware, instrumentation, operational procedure guidelines and further research to define failure modes and control techniques. Tasks are organized into the functional areas of well design, drilling, casing installation, cementing, completions, logging, brine reinjection and workovers.

399. GGIS-100220/J/ / /A/ / / / /

Title- Geopressured Geothermal Energy

Subtitle- Will it Work?

Author(s)- / Weeden , S. L. /

Journal- Ocean Ind.

Publication date- Vol. 11 , Issue 6 , 1976

Pagination- Page 119 , 8 Pages

Descriptor(s)- / Geothermal energy / Gulf of Mexico / Geopressured systems / Gulf Coast /

400. GGIS-100251/R/ / /M/ / / / /

Title- Geopressured Geothermal Fairway Evaluation and Test-Well Site Location, Frio Formation, Texas Gulf Coast

Author(s)- / Bebout , D. G. / Loucks , R. G. / Gregory , A. R. /

Publication date- January 1978

Pagination- 126 Pages

Report/patent- ORO--4891-4

Corporate Author- Texas University, Austin

Bureau of Economic Geology

Austin , Texas , USA

Descriptor(s)- / Austin Bayou Prospect / Distribution / Frio Formation / Geologic cross sections / Geopressure resources / Geopressured reservoirs / Gulf Coast / Regional analysis / Resource evaluations / Resource potential / Sandstone / Site selection / Texas /

Abstract by TIC

Tertiary strata of the Texas Gulf Coast comprise a number of terrigenous depositional wedges, some of which thicken abruptly at their downdip ends as a result of contemporaneous movement of growth faults and underlying salt. The Frio Formation, one of these wedges, has been studied regionally by means of a grid of

correlation cross sections aided by micropaleontological control. By means of these sections, the Frio was subdivided into six map units; maps of sandstone distribution within these units delineate principal elongate sandstone trends parallel to the Gulf Coast composed of deltaic, barrier-bar, and strandplain sandstones. These broad regional studies, followed by detailed local investigations, were pursued in order to delineate prospective areas for production of geopressed geothermal energy. A prospective area must meet the following minimum requirements: reservoir volume of 3 cubic miles, minimum permeability of 20 millidarcies (MD), and fluid temperatures of 300 DEG F. Several geothermal fairways were identified as a result of this Frio study. In summary, detailed geological, geophysical, and engineering studies conducted on the Frio Formation have delineated a geothermal test well site in the Austin Bayou Prospect which extends over an area of 60 square miles. A total of 800 to 900 feet of sandstone will occur between the depths of 13,500 and 16,500 feet. At least 30% of the sand will have core permeabilities of 20 to 60 millidarcies. Temperature at the top of the sandstone section will be 300 DEG F. Water, produced at a rate of 20,000 to 40,000 barrels per day, will probably have to be disposed of by injection into shallower sandstone reservoirs. More than 10 billion barrels of water are in place in these sandstone reservoirs of the Austin Bayou Prospect; there should be approximately 400 billion cubic feet of methane in solution in this water.

401. GGIS-100000/T/ / /C/ / / / /

Title- Geopressed Geothermal Information System

Author(s)- / Hill, Thomas R. /

Publisher- The University of Texas at Austin: Center for Energy Studies

Austin, Texas (USA)

Publication date- November 1, 1977

Local Availability- CES

Sponsor- / ERDA /

Corporate Author- Texas University, Austin

Center for Energy Studies

ENS 143, Austin, Texas, 78712, USA

Abstract by CES

The Center for Energy Studies at The University of Texas at Austin is developing the Geopressed Geothermal Information System to provide a coordinated information resource for support of research in geopressed geothermal energy. Its contents currently include a thesaurus, a bibliography, well log traces and well head statistics with index, research project statistics and abstracts, sand profiles, and the results of a social survey of attitudes in a county slated for a pilot development site. The digitized well logs provide a basis for a detailed regional study of formation parameters which are expected to prove useful to researchers in nongeothermal fields. These parameters will be displayed in both tabular and graphic (outline maps, histograms, etc.) formats. The system uses a variety of automated text-processing and computational software

Geopressured Geothermal Bibliography

to provide interactive as well as batch access. Following initial announcement of system availability to potential users, further documentation will be presented in a quarterly newsletter and in a series of users' bulletins. Funds for system development have been furnished by the Energy Research and Development Administration, several private utilities, and The University of Texas.

402. GGIS-100090/ / / /M/ / / / /

Title- Geopressured Geothermal Investigations in South Texas

(7/74 to 6/75)

Author(s)- / Dorfman , M. H. /

Publication date- 1975

Note- Funding \$100,000

Available- University of Texas, School of Engineering

Univ. of Texas

School of Engineering, Petroleum Engineering

200 W. 21ST

Austin, Texas 78712

Sponsor- / Texas Utilities Services, Inc. /

Corporate Author- Central Power and Light Co.

Abstract by Energyline

This research will augment the assessment of the geothermal resource in the Texas Gulf Coast region, the phase 0 scope-of-work and management study of the feasibility of the use of geopressured geothermal fluids on the Gulf Coast, and other research proposals related to the investigation of the geothermal potential of the Texas coastal area. It is anticipated that the resource will lead to specific objectives, such as site selection, environmental impact studies, drilling design and well drilling and practical demonstration of the use of geothermal fluids at test bed facilities. These funds will serve as seed funds for new projects needed for the overall feasibility and assessment studies and will also help unify and integrate all components in the geopressured geothermal area within the Center for Energy Studies.

403. GGIS-100095/ / / /M/ / / / /

Title- Geopressured Geothermal Investigations in South Texas

(7/75 to 6/76)

Author(s)- / Dorfman , Myron H. / Hyun , I. / Delatorre , F. G. /

Lui , W. Q. / Vancott , M. /

Available- University of Texas, School of Engineering

Univ. of Texas

School of Engineering, Petroleum Engineering

200 W. 21ST

Austin, Texas 78712

Sponsor- / Texas Utilities Services

Sponsor- / Gulf States Utilities /

Corporate Author- Central Power and Light Co.

Abstract by Energyline

A comprehensive program to delineate the extent of geopressured geothermal resources in Texas, including plans for reservoir evaluations and well design. This project will be conducted through the Center for Energy Studies.

404. GGIS-100023/J/ / 6009/A/ / / / /

Title- Geopressured Geothermal Prospects in the Frio Formation of the Texas Gulf Coast

Subtitle- Ideal Versus Actual Models

Author(s)- / Bebout , D. G. / Loucks , R. G. /

Publisher- American Association of Petroleum Geologists

Journal- American Association of Petroleum Geologist Bulletin

Publication date- Vol. 60 , Issue 9 , 1976

Pagination- Page 1606 , 2 Pages

405. GGIS-100586/R/ / /M/ / / / /

Title- Geopressured Geothermal Reservoir and Wellbore Simulation

(Final report, year 2)

Author(s)- / Garg , S.K. / Pritchett , J.W. / Brownell , D.H. / Riney , T.D. /

Publication date- 1978

Pagination- 151 Pages

Corporate Author- Systems, Science and Software

La Jolla , CA , USA

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Boreholes / Geopressured reservoirs / Simulation / Well drilling /

406. GGIS-100528/O/ / /A/ / / / /

Title- Geopressured Geothermal Reservoir Continuity

(Technical Note)

Subtitle- Louisiana and Texas Gulf Coast

Author(s)- / Boardman , Charles R. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 263 , 3 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-79NV10124 /

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Aquifers / Areal geology / Comparative evaluations / Data / Geopressured reservoirs / Gulf Coast / Louisiana / Texas /

Abstract by Author

Geopressured Geothermal Bibliography

The areal extent of aquifers which provide the production drive for Gulf Coast geopressured gas reservoirs are postulated to be representative of the areal extents of geopressured geothermal aquifers. Accordingly, the performances of nine water-drive geopressured gas reservoirs were analyzed to obtain inferences of the production-driving aquifers' sizes. Apparent areal extents of these aquifers ranged from 4 to 35 square miles. Two-thirds (6) of the aquifer extents exceeded 12 square miles. All three SP-log types (increased deflection upward and uniform deflection) are represented in this larger aquifer data set. Comparisons of these inferred aquifer volumes with those determined from well log data and correlations are consistent with the existence of hydraulic reservoir continuity across faults and pinch-outs of sand within fault compartments. The magnitudes of in situ rock pore volume compressibility and shale watering could also be evaluated by careful analysis of geopressured gas reservoir performance data.

407. GGIS-100126/I/ / /M/ / / / /

Title- Geopressured Geothermal Resource

Author(s)- / Austin, A. L. / Howard, J. H. /

Note- ERDA/RECON: "Expenditures: 0; 20000 " RCS PERF Type: FF "
Research location: TX: CA " Publication: Some Elements of the
Northern Gulf of Mexico Basin Geopressure Energy Resource,
UCRL--74807 REV. L. R. Myers R. Nelson, J. Howard, R. Austin
(LLL) GEORES Candidates

Sponsor- / U.S. Atomic Energy Comm. Div. App. Tech.

Sponsor- / ERDA /

Corporate Author- Lawrence Livermore Lab.
California, USA

Descriptor(s)- / Geothermal energy / Geothermal resources /
Feasibility studies / Geopressured systems /

408. GGIS-100528/O/ / /A/ / / / /

Title- Geopressured Geothermal Resource in Texas and Louisiana

Subtitle- Geological Constraints

Author(s)- / Bebout, D.G. / Gutierrez, D.R. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 13, 12 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-81NV10174

Sponsor- / Gas Research Inst., Chicago, IL (USA)

DE-AS05-78ET27160 /

Auxiliary expression(s)-

Illus. / Diagram (3) / Graph (7) / Map (5) /

Table

Ref.

Descriptor(s)- / Aquifers / Cretaceous Period / Geologic structures /
Geology / Geopressured zones / Gulf Coast / Louisiana / Sandstone
/ Tertiary period / Texas / US DOE /

Abstract by Author

The objective of the DOE-funded geopressured geothermal project is to assess the viability of producing energy from the deep surface aquifers of the Texas and Louisiana Gulf Coast. These aquifers must comprise thick extensive sandstone units with high temperature, high porosity and permeability, and low salinity. Regional studies indicate that these ideal aquifers are not common; in fact, none have yet been found. Geological studies have demonstrated that sandstones decrease in abundance and thickness with depth; however, exceptions do occur and some are now being drilled and tested. Porosity and permeability also decrease with depth, but differences in original composition, burial history, and diagenesis result in variations in preserved porosity. Salinity within the geopressured zone is highly variable and probably related to aquifer porosity and permeability, thickness and lateral extent, and to the nature of the bounding growth faults. Locating ideal aquifers for testing the geopressured geothermal resource requires a thorough knowledge of the regional geology in order to identify prospects which meet the maximum number of requirements. It is doubtful that any prospect will meet all of the requirements of an ideal model.

409. GGIS-100528/0/ / /A/ // //

**Title- Geopressured Geothermal Resource Potential of Miocene Bayou
Hebert Prospect , Vermilion and Iberia Parishes, Louisiana**

Author(s)- / McCulloh , Richard P. / Pino , Miguel A. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (
October 13 , 1981)

Publication date- 1981

Pagination- Page 237 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)
DE-AC08-81NV10174 /

Auxiliary expression(s)-

Illus. / Diagram (2) / Map (2) /

Ref.

Descriptor(s)- / Geopressured zones / Iberia Parish / Louisiana /
Miocene Epoch / Resource assessment / Resource potential /
Vermilion Parish /

Abstract by Author

The Bayou Hebert prospect is a fault-bounded block of lower Miocene shale and sandstone which covers a 75-square-mile area in southeastern Vermilion and southwestern Iberia parishes, southwestern Louisiana. The average depth to the top of the geopressured zone is 12,500 feet. Detailed correlation of shale resistivity patterns on well logs from this area has delineated faults, local unconformities, and changes in thickness and facies of lithologic units. Most faults revealed by this method are associated with the boundary fault zones, but the few delineated in the interior of the prospect could reduce the

Geopressured Geothermal Bibliography

volume of potential reservoir units. Cross sections show that the Lower Miocene section thickens across growth faults by addition of new units as well as by expansion. Of the parameters of reservoir volume, salinity, temperature, and permeability, reservoir volume shows the most significant variation and indicates that the eastern fourth of the prospect has the most geopressured geothermal potential.

410. GGIS-100085/ / / /M/ / / / /

Title- Geopressured Geothermal Resource Utilization Development
(7/75 to 6/76)

Author(s)- / Austin , A. L. / Howard , J. H. /

Publication date- 1975

Note- Estimated Calendar Year Funding Reported as 1975 \$200,000

Available- Univ. of California, Lawrence Livermore Lab.

Univ. of California

Lawrence Livermore Laboratory

P.O. Box 808

Livermore, California 94550

Descriptor(s)- / Feasibility studies / Geopressure resources / Gulf Coast / Methane / Resource assessment / Resource development / Total flow systems /

Abstract by Energyline

The purpose of this program is to carry out the necessary development work leading to methods for economical recovery and conversion of the energy stored in geopressured deposits. Known deposits underlie the Gulf Coast region of the United States, where there may be enough energy stored in form of heat and pressure to supply millions of megawatt-years of electric energy. Also, it is estimated that significant quantities of methane are associated with these water deposits. The geopressured resource development program will initially emphasize resource and reservoir assessment activities. Conversion of the energy to electricity may utilize the higher efficiency total flow concept, once developed. The first task will be to carry out a general feasibility study including sufficient field work to better define the nature and extent of exploitable reservoirs.

411. GGIS-100400/R/ / /M/ / / / /

Title- Geopressured Geothermal Resources:

Subtitle- An Unconventional Energy Source

Publication date- September 1 , 1979

Pagination- 9 Pages

Available- U.S. Department of Energy

Division of Geothermal Energy

Washington, D.C.

20585

(Paper copy)

Local Availability- CES

Corporate Author- Department of Energy

Div. of Geothermal Energy

Washington, D.C. , USA

Auxiliary expression(s)-

Illus. / Diagram (7) / Graph (1) / Map (5) /
Table

Ref.

Descriptor(s)- / Brazoria County / Demonstration plants / Development
/ Economics / Edna Delcambre No. 1 Well / Energy policy /
Environmental effects / Exploratory wells / Feasibility studies
/ Geopressure resources / Geothermal energy conversion / Gulf
Coast / Institutional aspects / Louisiana / Natural gas /
Planning / Production / Research programs / Resource assessment
/ Resource potential / Texas / US DOE / Wells of opportunity /

Abstract by GGIS

It was first suggested in the mid-1960's that the pressure, heat, and entrained methane of the geopressured geothermal resources in the Gulf Coast Basin of the United States could be exploited as energy sources. Only recently, however, and in light of the increasing energy shortage, has serious consideration been directed toward development of this resource. Geopressured formations develop as sedimentary deposits are overlain by new deposits and eventually buried. Trapped fluids are forced out of the shales in the deeper formations into adjoining sands. The variables of pressure, temperature, and amount of dissolved solids have made it difficult to estimate accurately the potential resource. The DOE geopressured-geothermal energy program is intended to study: size of the potential resource; feasibility and type of reservoir development; economics of resource production; parameters with the greatest effect on production profitability; magnitude and cost of environmental considerations. To do this, the long term program will cover these areas: (1) regional planning -- analysis of the economic, institutional and technological framework for exploration in coordination with authorities, industries, utilities, field operators and public interest groups; (2) resource definition -- assessment of all known geopressured formations in Texas and Louisiana through drilling and test wells; (3) technology development; (4) environmental considerations; and (5) facilities.

412. GGIS-100321/ / / /M/ / / / /

Title- Geopressured Reservoir Parameters of the Armstrong Fairway,
Kenedy County, South Texas

Author(s)- / Hainey , Bryant Wilson /

Publication date- May 1979

Pagination- 97 Pages

Local Availability- CES

Auxiliary expression(s)-

Illus. / Illus. (23) /

Ref.

Appendix

Descriptor(s)- / Bottom hole temperature / Electrical logging / Frio
formation / Geopressured reservoirs / Kenedy County /
Permeability / Porosity / Productivity / Reservoir properties /
Reservoir temperature / Salinity / SP logging / Texas / Well
logging / Reservoir pressure /

Geopressured Geothermal Bibliography

Abstract by Author

The geopressured reservoir parameters of the Armstrong Fairway in Kenedy County, South Texas were studied to help determine the area's potential for geothermal energy production. The history of oil and gas development in the region and the geology of the area were reviewed. Formation pressures were determined from shale resistivities of electric logs, the salinity of formation waters were measured from SP logs and equilibrium formation temperatures were calculated from logging bottom hole temperature data. The rock properties of porosity and permeability were also examined. While the Armstrong Fairway contains extensive, thick, geopressured sands in the Frio formation, temperatures are only moderately hot except at great depth and salinities in geopressured sands are probably too high for the water to be used for consumption of irrigation and will have to be reinjected. In addition, the low permeability of Frio sandstones may restrict the deliverability of a well in this area. Based on this study of reservoir parameters, the Armstrong Fairway appears to be only marginally attractive as a source of geopressured geothermal energy.

413. GGIS-100076/R/ / 7/A/ // //

Title- Geopressured Resource R and D

(Appendix G in Program Definition for the Development of Geothermal Energy; Appendices, Vol. 3)

Publisher- Jet Propulsion Lab.

Pasadena, California

Publication date- Vol. 3 , 1975

Pagination- 8 Pages

Report/patent- JPL--5040-6 (Vol.3)

Descriptor(s)- / Geophysical surveys / Geopressured systems / Geothermal exploration / Geothermal resources / Research programs / Thermal waters / Well logging /

Abstract by ERDA/RECON

This appendix provides a background on the current knowledge and uncertainties associated with the development of this potentially valuable resource. (MOW)

414. GGIS-100296/J/ / /A/ // //

Title- Geopressured Resource:

Subtitle- A Sleeping Giant

Author(s)- / Holt , Ben /

Journal- Hydrocarbon Process

Publication date- Vol. 56 , Issue 7 , July 1977

Pagination- Page 96 , 3 Pages

Corporate Author- Ben Holt Co.

Pasadena , California , USA

Auxiliary expression(s)-

Illus. / Figure (2) /

Ref.

Descriptor(s)- / Economics / Electric power / Environmental effects /
Geopressure resources / Gulf Coast / Legal aspects / Louisiana /
Methane / Power generation / Resource assessment / Texas /

Abstract by Author (rev.)

At depths ranging commonly from 10,000 to 20,000 feet and extending onshore and offshore in a broad band 100 to 200 miles wide and 800 miles long in Texas and Louisiana is an immense body of hot water containing dissolved methane and existing at pressures exceeding hydrostatic. This is the Gulf Coast geopressed resource. From oil and gas well drilling experience the resource is known to exist. The technology to recover and utilize the energy also exists. But, no one knows as yet how much energy can be recovered or at what cost. A knowledge of and an interest in this resource have so far largely been confined to the geothermal community. The geopressed resource is potentially of great importance to the future of the hydrocarbon processing industry, centered as it is in the same geographical area. The author reviews the potential methane content, electric power generating capacity, resource utilization schemes, and legal, economic, and environmental problems associated with this geopressed area.

415. GGIS-100011/O/ / /A/ / / / /

Title- Geopressed Systems

(3. Subgroup Paper)

Author(s)- / Dorfman , Myron /

Conference- Magnitude and Deployment Schedule of Energy Resources

Publication date- September 1975

Pagination- Page 70 , 7 Pages

Report/patent- CONF--750720-

Auxiliary expression(s)-

Illus.

Ref.

Descriptor(s)- / Geology / Tectonics / Energy resources /
Geopressed systems /

Abstract by NTIS

Geothermal zones and power production estimates are discussed.
Map shows resource areas. 8 refs.

416. GGIS-100300/J/ / /A/ / / / /

Title- Geopressed Water/Gas as Potential Energy Source

Journal- Mech. Eng.

Publication date- Vol. 101 , Issue 4 , April 1979

Pagination- Page 48 , 1 Pages

Local Availability- ENG

Descriptor(s)- / Binary cycles / Electric power / Geopressed zones /
Louisiana / Natural gas / Power generation / Research programs /
Texas /

Abstract by GGIS

Research sponsored by the Electric Power Research Institute and performed by Southwest Research Institute is examining the commercial recovery of natural gas from brine extracted from

Geopressured Geothermal Bibliography

Texas and Louisiana geopressured zones. To realize maximum resource utilization researchers are also investigating binary-cycle systems for heat conversion and ways of strengthening existing equipment for converting pressure into electric energy.

417. GGIS-100341/J/ / /A/ / / / /

Title- Geopressured Zones Key to Tomorrow's Gas Supplies

Author(s)- / Rosenberg, Robert B. /

Journal- Pipeline Gas J.

Publication date- Vol. 206, Issue 11, September 1979

Pagination- Page 52, 4 Pages

Corporate Author- Gas Research Inst.

Chicago, Illinois, USA

Descriptor(s)- / Economics / Gas production / Geopressured zones /

Methane / Resource assessment / Technology assessment /

Abstract by- Compendex

Geopressured zones, one of the unconventional sources of natural gas, have generated much interest in the U.S. recently. This article briefly describes the current status of geopressured-gas technology and indicates the primary areas of uncertainty that must be resolved before the size of the resource can be fully assessed. Natural gas from geopressured zones could provide from 150 to 2000 trillion cu ft of gas in the future--anywhere from 5 to 100 years' supply at present consumption rates--if the zones can be economically and efficiently produced.

418. GGIS-100588/R/ / /M/ / / / /

Title- Geopressured-Geothermal Drilling and Testing Plan

Subtitle- Magma Gulf/Technadril-Dept. of Energy MGT-DOE Amoco Fee

No. 1 Well, Cameron Parish, Louisiana

Publication date- July 1980

Pagination- 97 Pages

Sponsor- / Department of Energy, Washington, D.C.

AC08-78ET27082 /

Corporate Author- Department of Energy

Nevada Operations Office

Las Vegas, NV, USA

Descriptor(s)- / Cameron Parish / Drilling / Geopressured systems /

Health hazards / MG-T/DOE Amoco Fee No. 1 Well / Safety / Testing

/ Well testing /

Abstract by- NTIS

The following topics are covered: generalized site activities; occupational health and safety, drilling operations, production testing, environmental assessment and monitoring plan, permits, program management, reporting, and schedule.

419. GGIS-100339/R/ / /M/ / / / /

Title- Geopressured-Geothermal Drilling and Testing Plan

Subtitle- General Crude Oil - Dept. of Energy Pleasant Bayou No. 1
Well, Brazoria County, Texas
Publication date- May 1978
Pagination- 102 Pages
Report/patent- NVO-194
Available- NTIS
(Paper Copy)
(Microfiche)
Local Availability- CES
Corporate Author- U.S. Department of Energy
Nevada Operations Office
Las Vegas , Nevada , USA
Descriptor(s)- / Brazoria County / Compaction / Depth / Disposal wells
/ Dissolved gases / Environmental effects / Flow rate / Fluid
pressure / Drilling / Geopressured wells / Geothermal fluids /
Ground subsidence / Gulf Coast / Health hazards / Permeability /
Planning / Porosity / Pressure decline / Reservoir pressure /
Reservoir temperature / Reservoir thickness / Resource
assessment / Rock properties / Safety / Sampling / Site
preparation / Surface equipment / Testing / Texas / Viscosity /
Abstract by TIC

As a result of geopressured resource assessment studies in the Gulf Coast region, the Brazoria fairway, located in Brazoria County, Texas was determined to be an optimum area for additional studies. A plan is presented for drilling completion, and testing of one geopressured-geothermal well and two disposal wells in Brazoria County, Texas. The objectives of the well drilling and testing program are to determine the following parameters: reservoir permeability, porosity, thickness, rock material properties, depth, temperature, and pressure; reservoir fluid content, specific gravity, resistivity, viscosity, and hydrocarbons in solution; reservoir fluid production rates, pressure temperature, production decline, and pressure decline; geopressured well and surface equipment design requirements for high-volume production and possible sand production; specific equipment design for surface operations, hydrocarbons distribution, and effluent disposal; and possibilities of reservoir compaction and/or surface subsidence.

420. GGIS-100340/R/ / /M/ / / / /

Title- Geopressured-Geothermal Drilling and Testing Plan

Subtitle- General Crude Oil - Dept. of Energy Pleasant Bayou No. 2
Well, Brazoria County, Texas
Publication date- April 1977
Pagination- 103 Pages
Report/patent- NVO-194 (Rev. 1)
Available- NTIS
(Paper Copy)
(Microfiche)
Local Availability- CES
Corporate Author- U.S. Department of Energy
Nevada Operations Office
Las Vegas , Nevada , USA
Descriptor(s)- / Brazoria County / Disposal wells / Environmental
effects / Drilling / Site selection / Texas / Geopressured

Geopressured Geothermal Bibliography

systems / Geopressured wells / Injection / Licencing /
Management / Planning / Safety / Testing / Drill cores / Drilling
fluids / Drilling rigs / Erosion / Pipes / Site preparation /
Well casings /

Abstract by TIC

A program to conduct the drilling, completion and testing of one geopressured-geothermal well (Pleasant Bayou No. 1) and two disposal wells in Brazoria County, Texas, is described. Problems with Pleasant Bayou No. 1 forced its plugging back to the bottom of the 13 3/8 casing at approximately 8,400 feet. This hole will be used as one of the two disposal wells. This revised plan describes moving the rig 500 feet southwest of the Pleasant Bayou No. 1 and drilling the offset Pleasant Bayou No. 2 using the same program objectives. The following are covered in this plan: generalized site activities, occupational health and safety, drilling operations, production testing, environmental assessment and monitoring program, permits, program management, reporting, and schedule.

421. GGIS-100153/0/ / /A/ / / / /

Title- Geopressured-Geothermal Energy from the Frio Formation,
Texas Gulf Coast

Subtitle- Review of Ideal and Actual Prospects

Author(s)- / Bebout, D. G. / Loucks, R. G. /

Conference- 11th Annual Meeting of the Geological Society of America,
South-Central Section

El Paso

Texas

USA (March 17, 1977)

Publication date- Vol. 9, January 1977

Pagination- Page 4, 1 Pages

Corporate Author- Texas University, Austin

Austin, Texas, USA

Descriptor(s)- / Brazoria County / Formation thickness / Frio
Formation / Geological surveys / Geopressure exploration /
Geopressured reservoirs / Geopressured zones / Geothermal
exploration / Gulf Coast / Methane / Permeability / Sand / Shale
/ Tertiary Period / Texas / Geopressured systems / Gulf of Mexico
/

Abstract by DOE/RECON

The Bureau of Economic Geology, the University of Texas at Austin, has been searching for geopressured geothermal prospects in the downdip portion of several offlapping, basin-ward-thickening wedges of Tertiary sand and shale along the Texas Gulf Coast. The ideal prospect model is a reservoir with a volume of at least three cubic miles (which translates into a cumulative sand thickness of greater than 300 feet and areal extent of 50 square miles), greater than 300/SUP O/F subsurface fluid temperature, permeability greater than 20 millidarcies, and water saturated with methane. Several prospective geothermal fairways have been identified in the Frio Formation of Kenedy, Nueces, Matagorda, and Brazoria Counties. However, only the prospect in the Brazoria Fairway (the Austin Bayou Prospect) meets all of the requirements of the ideal geopressured geothermal prospect. The Austin Bayou Prospect

contains up to 1,200 feet of sand with hundreds of millidarcies permeability below 13,500 feet in depth. The optimal sand thickness extends over an area of at least 60 square miles/subsurface temperatures are as high as 330/SUP O/F. Enormous reservoirs extending over hundreds of square miles with hundreds of millidarcies permeability predicted by previous workers have not been found in the frio. However, initial studies indicate that the smaller reservoirs which are being delineated are capable of producing significant quantities of thermal energy and methane.

422. GGIS-100525/R/ / /M/ // //

Title- Geopressed-Geothermal Energy Development

Subtitle- Government Incentives and Institutional Structures

Author(s)- / Frederick , D.O. / Prestwood , D.C.L. / Roberts , K. /
Vanston , J.H. /

Publication date- 1979

Pagination- 207 Pages

Report/patent- ORO-5959-T1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

FG05-78OR05959 /

Corporate Author- Texas Univ.

Center for Energy Studies

Austin , USA

Descriptor(s)- / Commercialization / Energy source development /
Financial incentives / Geopressure resources / Geothermal
industry / Government policies / Industry / Institutional
aspects / Legal aspects / Market / Natural gas industry / Public
utilities / Resource potential / Texas /

Abstract by NTIS

The following subjects are included: a geothermal resource overview, the evolution of the current Texas geopressed-geothermal institutional structure, project evaluation with uncertainty and the structure of incentives, the natural gas industry, the electric utility industry, potential governmental participants in resource development, industrial users of thermal energy, current government incentives bearing on geopressed-geothermal development, six profiles for utilization of the geopressed-geothermal resources in the mid-term, and probable impacts of new government incentives on mid-term resource utilization profiles.

423. GGIS-100360/R/ / /M/ // //

Title- Geopressed-Geothermal Energy Development:

(Geopressed-Geothermal Technical Paper No. 3)

Subtitle- Social and Economic Issues

Publication date- July 1979

Pagination- 53 Pages

Geopressured Geothermal Bibliography

Report/patent- DOE/ET/28464-1 (vol. 3)

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Department of Energy

ET-78-G-05-5958 /

Corporate Author- RPC, Inc.

Austin, Texas, USA

Auxiliary expression(s)-

Illus. / Figure (7) /

Table

Ref.

Descriptor(s)- / Energy source development / Geopressure resources /
Leasing / Socio-economic factors / Texas /

Abstract by Author

This paper presents information relevant to rule-making for geopressured-geothermal development on state-owned lands. The analysis is focused on those potential social and economic effects of resource development, if any, which may require special attention during the leasing and permitting process. For the most part, many of the expected socioeconomic impacts are not unique to geothermal development, but are already being felt by residents of the fairways because of ongoing developmental activities. The social and economic impacts likely to result from resource development depend upon characteristics specific to the site and surrounding social and economic systems. Specific impacts and their probability, magnitude, and duration can only be determined through a case-by-case analysis.

424. GGIS-100587/B/ / /M/ / / / /

Title- Geopressured-Geothermal Energy Investigations in the Vicinity
of Grand Isle, Lafourche and Jefferson Parishes, Louisiana

Author(s)- / Hixon, R.L. /

Publication date- 1979

Descriptor(s)- / Geopressured zones / Geothermal exploration /
Jefferson Davis Parish / Lafourche Parish / Louisiana /

425. GGIS-100359/R/ / /M/ / / / /

Title- Geopressured-Geothermal Resource Development on Public Free
School Lands

Publication date- July 1979

Pagination- 105 Pages

Report/patent- DOE/ET/28464-1

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Department of Energy

ET-78-G-05-5958 /

Corporate Author- RPC, Inc.

Austin, Texas, USA

Auxiliary expression(s)-

Illus. / Figure (3) / Map (4) /

Table

Descriptor(s)- / Energy source development / Environmental effects /
Feasibility studies / Financing / Geopressure resources /
Leasing / Legislation / Public lands / Regulations / Texas /

Abstract by Author

This study was formulated to make recommendations to the commissioner of the General Land Office of Texas and the School Land Board in order to encourage and promote the development of the geopressured-geothermal resource on Public Free School Land. These recommendations were to be based on analyses of the financial feasibility of resource development, the potential environmental effects, and associated legal issues. In addition, the recommendations were to include draft rules and regulations concerning the leasing, exploration, and production of the resource on PFSL. The recommendations from this study are designed to contribute to rapid and orderly resource development by providing an initial framework for development on PFSL in an environmentally sound manner, thus reducing uncertainty for the field developer. Consequently, if and when the time comes for exploration and development of the resource on PFSL, the field developer will know what to expect in terms of leasing and permitting procedures, and he will know how to proceed.

426. GGIS-100526/R/ / /M/ / / / /

Title- Geopressured-Geothermal Test of the Edna Delcambre No. 1
Well, Tigre Lagoon Field, Vermilion Parish, Louisiana
(Final Report)

Subtitle- Geology of the Tigre Lagoon Field, Planulina Basin

Publication date- October 1978

Pagination- 53 Pages

Report/patent- ORO-4937-T2

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

EY-76-S-05-4937 /

Corporate Author- McNeese State Univ.

Lake Charles, LA, USA

Descriptor(s)- / Diagenesis / Geopressured systems / Geothermal
gradients / Hydrodynamics / Hydrology / Louisiana / Natural gas /
Salinity / Sedimentary basins / Temperature effects / Tigre
Lagoon Geothermal Field / Vermilion Parish /

Abstract by NTIS

The geology and hydrology of the Tigre Lagoon Gas Field and the structural and depositional basin in which it occurs, as described, define a hydrodynamic system which has been in operation for millions of years. Fluid entrapment and geopressing of the deposits has resulted in steepened geothermal gradients, accelerated maturation and thermal degradation (cracking) of fluid hydrocarbons, thermal diagenesis of certain clay minerals with release of much bound and intracrystalline water as free pore water, and a systematic

Geopressured Geothermal Bibliography

fluid migration history controlled by the sand-bed aquifers in the basin, and by upward leakage at growth faults wherever fluid pressures approached or exceeded rock pressures. Observed geotemperature, geopressure, water salinity, and natural gas occurrence in the study area conform with the conceptual model developed.

427. GGIS-100320/R/ / /M/ / / / /

Title- Geopressured-Geothermal Test of the Edna Delcambre No. 1 Well, Tigre Lagoon Field, Vermilion Parish, Louisiana

Subtitle- Analysis of Water and Dissolved Natural Gas

Author(s)- / Hankins , B.E. / Karkalits , O.C. /

Publication date- September 1978

Pagination- 144 Pages

Report/patent- ORO--4937--T1

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

EY-76-S-05-4937 /

Corporate Author- McNeese State Univ.

Lake Charles , Louisiana , USA

Auxiliary expression(s)-

Illus / Figure (17) /

Table

Ref.

Descriptor(s)- / Chemical composition / Dissolved gases / Dissolved solids / Gas analysis / Geopressured wells / Geopressured zones / Louisiana / Methane / Qualitative chemical analysis / Quantitative chemical analysis / PH Value / Salinity / Tigre Lagoon geothermal field / Vermilion Parish / Water analysis /

Abstract by Author

The main objective of the research reported here was to determine the volume of gas dissolved in the geopressured water, as well as the qualitative and quantitative composition of the water and the dissolved gas. A further objective was to use an existing shut-in gas well so that drilling time and the attendant costs could be avoided. The Edna Delcambre et al. No. 1 gas well, shut-in since June 1975, was made available for the project. Two geopressured sand-bed aquifers were tested: sand No. 3 at a depth of 12,900 feet and sand No. 1 at a depth of 12,600 feet. Each aquifer was subjected to flow tests which lasted approximately three weeks in each case. The temperature in sand No. 3 was about 238 DEG F and the pressure was about 10,990 psig. The temperature in sand No. 1 was about 234 DEG F with a pressure of 10,600 psig. Water flow rates from sand No. 3 varied from 2,500 to 9,000 barrels per day. The net sand thickness of sand No. 3 was 52 feet and permeability was 40.6 millidarcies. Water flow rates on sand No. 1 varied from 1,200 to 11,800 barrels per day. The net sand thickness of sand No. 1 was 30 feet and the permeability was 364 millidarcies. Water samples were obtained during flow testing of the two geopressured aquifers. The water contained 11.3-13.3% dissolved solids. The water was acidic, but in-line measurements of pH were 1-2 pH units lower than

comparable samples measured in the on-site laboratory. Several radioactive species were measured. Radium-226 was found to be approximately 10 times more concentrated than the average amount observed in surface waters. No appreciable amount of heavy metals was detected. Recombination studies at bottom-hole conditions indicate the solubility of natural gas per barrel of water to be about 24 SCF. The methane content was 93-95%, and the gas had a heating value in the range of 1,020-1,070 BTU/cu. ft. During the flow tests, the gas/water ration at the well-head was observed to be 45-88 SCF/bbl water produced. Collections of bottom-hole samples from each of the sand-bed aquifers were attempted with a wire-line sampler. Several attempts were made to obtain representative samples but none of the attempts proved to be satisfactory.

428. GGIS-100570/R/ / /M/ // //

Title- Geopressured-Geothermal Testing of Five Dry Holes During 1980 and 1981

Author(s)- / Klauzinski , R.Z. /

Publication date- 1981

Pagination- 10 Pages

Report/patent- DOE/ET/27081-6

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80ET27081 /

Corporate Author- Eaton Operating Co., Inc.

Houston , TX , USA

Descriptor(s)- / Aquifers / Geopressured reservoirs / Louisiana / Testing / Texas / US DOE /

Abstract by NTIS

This paper summarizes the testing of five hot, geopressured aquifers in different geologic environments in Texas and Louisiana by Eaton Operating Company for the U.S. Department of Energy. The results were encouraging. Natural gas-to-brine content ranged from 33.0 to 55.0 SCF/bbl. Gas production rates ranged from 93 to 600 MCFD. Sustained water production rates ranged from 1950 to 15,000 BWPd. Bottom-hole temperatures ranged from 260 to 327 deg F. Reservoir pressures ranged from 6627 psia to 13,203 psia. A test near Beaumont resulted in discovery of oil and gas.

429. GGIS-100581/R/ / /M/ // //

Title- Geopressured-Geothermal Testing of Five Dry Holes During 1980 and 1981

Author(s)- / Klauzinski , R.Z. /

Publication date- 1981

Pagination- 10 Pages

Report/patent- DOE/ET/27081-6

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80ET27081 /

Geopressured Geothermal Bibliography

Descriptor(s)- / Aquifers / Geopressured reservoirs / Louisiana /
Reentry / Testing / Texas / US DOE / Well testing /
Abstract by NTIS

This paper summarizes the testing of five hot, geopressured aquifers in different geologic environments in Texas and Louisiana by Eaton Operating Company for the U.S. Department of Energy. The results were encouraging. Natural gas-to-brine content ranged from 33.0 to 55.0 SCF/bbl. Gas production rates ranged from 93 to 600 MCFD. Sustained water production rates ranged from 1,950 to 15,000 BWPB. Bottom-hole temperatures ranged from 260 to 327 deg F. Reservoir pressures ranged from 6,627 psia to 13,203 psia. A test near Beaumont resulted in discovery of oil and gas.

430. GGIS-100002/0/ / 2/A/ / / / /

Title- Geopressures
(Supplement)

Author(s)- / Stuart , Charles A. /
Conference- Abnorm. Subsurf. Pressure
Baton Rouge
Louisiana
USA

Publication date- Vol. 2 , 1970

Pagination- 121 Pages

Descriptor(s)- / Gulf of Mexico / Economic geology / Petroleum /
Regional / Production / Geopressure /

431. GGIS-100002/0/ / 2/A/ / / / /

Title- Geopressures
(Abstract)

Author(s)- / Stuart , Charles A. /
Conference- Abnorm. Subsurf. Pressure
Baton Rouge
Louisiana
USA

Publication date- Vol. 2 , 1970

Pagination- Page 1 , 3 Pages

Descriptor(s)- / Gulf of Mexico / Cenozoic Era / Sediments /
Engineering geology / Geopressured reservoirs / Geopressure /
Regional / Gradient / Porosity / Relation /

432. GGIS-100046/J/ / 24/A/ / / / /

Title- Geopressures and Secondary Porosity in the Deep Jurassic of
Mississippi

Author(s)- / Parker , Calvin A. /
Publisher- Gulf Coast Association Geological Society
Journal- Transactions, Gulf Coast Association of Geologic Societies
Publication date- Vol. 24 , 1974

Pagination- Page 69 , 12 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Mississippi / Petroleum / Economic geology / United States / Gas / Sedimentary rocks / Sandstone / Pressure buildup / Geopressure / Gases / Carbon dioxide / Hydrogen sulfide / Gradient / Distribution / Porosity / Secondary / Jurassic / Smackover Formation / Norphlet Formation /

433. GGIS-100023/J/ / 5810/A/ / / / /

Title- Geopressures and Secondary Porosity in Deep Jurassic of Mississippi

Author(s)- / Parker, C. A. /

Publisher- American Association of Petroleum Geologists

Journal- American Association of Petroleum Geologist Bulletin

Publication date- Vol. 58, Issue 10, 1974

Pagination- Page 2212, 1 Pages

Note- in GCAGS-SEPM Annual Meeting. GEOREF lists as abstract

Descriptor(s)- / Mississippi / Petroleum / Economic geology / United States / Gas / Sedimentary rocks / Sandstone / Pressure buildup / Gases / Carbon dioxide / Hydrogen sulfide / Gradient / Distribution / Porosity / Secondary / Jurassic / Smackover Formation / Norphlet Formation /

434. GGIS-100009/O/ / /M/ / / / /

Title- Geopressures and Secondary Porosity in Deep Jurassic of Mississippi

Author(s)- / Parker, C. A. /

Conference- Gulf Coast Association of Geological Societies ISEPM Annual Meeting

Publisher- Gulf Coast Association of Geological Societies

435. GGIS-100023/J/ / 6004/A/ / / / /

Title- Geopressures and Secondary Porosity in Deep Smackover of Mississippi

Author(s)- / Parker, C. A. /

Publisher- American Association of Petroleum Geologists

Journal- American Association of Petroleum Geologist Bulletin

Publication date- Vol. 60, Issue 4, 1976

Pagination- Page 705, 1 Pages

Note- NTIS: (EN).

Descriptor(s)- / Jurassic / United States / Mississippi / Geopressure / Petroleum gas / Natural / Smackover Formation / Sedimentary rocks / Clastic rocks / Terrigenous / Sandstone / Reservoir properties / Secondary porosity / Economic geology /

436. GGIS-100053/J/ / 2508/A/ / / / /

Geopressured Geothermal Bibliography

Title- Geopressures in the Deep Smackover of Mississippi

Author(s)- / Parker, Calvin A. /

Journal- Journal of Petroleum Technology

Publication date- Vol. 25, Issue 8, August 1973

Pagination- Page 971, 9 Pages

Descriptor(s)- / Petroleum reservoir engineering / Mississippi / Oil wells / Bottom hole pressure / Petrology / Sedimentology /

Abstract by NTIS

Geopressures in the interior basin of Mississippi appear to be geologically late events associated with inflation and hydrocarbon phase changes. Acids associated with these late geopressures have impressed secondary porosity in Deep Smackover sandstones. Anomalous deep porosity in Mississippi need not be overpressured and is primary porosity. By means of field examples, this paper examines diverse origins for the deep Jurassic geopressures and contrasts them with origins of geopressures in the Gulf Coast Tertiary. 15 refs.

437. GGIS-100002/0/ / 3/A/ / / / /

Title- Geopressures in the Smackover of Mississippi

Author(s)- / Parker, Calvin A. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 3, 1972

Pagination- Page 109, 4 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Mississippi / Engineering geology / Geopressured reservoirs / Overburden pressure / Gulf Coast / Rankin County / Geopressure / Pressure buildup / Porosity / Sandstone / Carbonate rocks / Distribution / Traps / Oil and gas fields / Jurassic / Smackover Formation / United States /

438. GGIS-100053/J/ / /A/ / / / /

Title- Geopressuring Mechanism of Smackover Gas Reservoirs, Jackson Dome Area, Mississippi

Author(s)- / Stuart, C.A. / Kozik, H.G. /

Publication date- Vol. 29, Issue 5, May 1977

Pagination- Page 579, 7 Pages

Corporate Author- Shell Oil Co.

Auxiliary expression(s)-

Illus. / Figure (7) /

Table

Ref.

Descriptor(s)- / Compacting / Geopressure gradients / Geopressured reservoirs / Geosynclines / Mississippi / Natural gas / Porosity / Reservoir pressure / Smackover formation / Temperature gradients /

Abstract by Compendex

To help understand the problems associated with geopressures in the Mississippi salt basin, the Smackover sour gas reservoirs were studied and a geopressing mechanism was conceived. The concept presented is that gas was sealed in a confined container, and then geopressed by the temperature and pressure of the earth's crust with subsequent burial. Knowledge of temperature gradients in the basin and trends in gas composition have permitted accurate forecasts of abnormal pressures in two discoveries. The authors conclude that porosities in the basin should be preserved below 20,000 ft.

439. GGIS-100190/ / / /A/ / / / /

Title- Geothermal

Subtitle- New Potential Underground

Author(s)- / Charlson , Michael /

Journal- EPRI Journal

Publication date- December 1981

Pagination- Page 18 , 8 Pages

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Photo (5) /

Ref.

Descriptor(s)- / Binary cycle power systems / Computer codes / Energy conversion / Geopressed systems / Geothermal energy / Geothermal resources / Hydrothermal systems / Magma systems / Power generation / Public utilities / Research programs / Technology assessment /

Abstract by FC

A brief history of geothermal development is described, followed by a discussion of the current focus (and in particular the technology) of geothermal development

440. GGIS-100181/O/ / /M/ / / / /

Title- Geothermal

Subtitle- State of the Art

Conference- Geothermal; State of the Art

San Diego

California

USA (May 9 , 1977)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- 1977

Pagination- 315 Pages

Report/patent- CONF-770569---

441. GGIS-100284/R/ / /M/ / / / /

Title- Geothermal and Geopressure Blowout Control

Subtitle- Phase I: Study of Existing Technology; Phase II: Program Plan for Geothermal and Geopressure Blowout Control

Geopressured Geothermal Bibliography

Author(s)- / Rehm , William A. / Goins , W.C., Jr. /
Journal- A Study of Technology in Well Control for Geothermal and
Geopressured Wells
Publication date- November 1978
Pagination- 276 Pages
Report/patent- IDO-1603-1
Available- NTIS
(Paper Copy)
(Microfiche)
Local Availability- CES
Sponsor- / Department of Energy
EG-76-C-07-1603 /
Corporate Author- Maurer Engineering, Inc.
Houston , Texas , USA

442. GGIS-100895/ / / /A/ / / / /

Title- Geothermal and Geopressure Patterns of Bayou Carlin-Lake
Sand Area, South Louisiana

Subtitle- Implications

Author(s)- / Kumar , Madhurendu Bhushan /

Conference- AAPG--Sepm Annual Convention

Publication date- Vol. 61 , Issue 1 , January 1977

Pagination- Page 65 , 14 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Anticlines / Exploration methods / Geology /
Geopressure zones / Growth faults / Louisiana / Maps / Petroleum
exploration / Reservoir pressure / Reservoir temperature /

Abstract by Compendex

This study examines the patterns of subsurface pressures and temperatures in light of the known geologic history of the area and recommends geothermal-geopressure mapping as an important and regular adjunct to the conventional approaches to petroleum exploration where well control exists. The Bayou Carlin-Lake Sand area is part of a well-known "hot belt" and geopressured region of south Louisiana. The geothermal approach is recommended for selecting areas of possible petroleum prospects prior to detailed appraisal, for delineating untested rollover anticlines against growth faults, and for locating deeper hydrocarbon accumulations of commercial significance.

443. GGIS-100411/0/ / 1/A/ / / / /

Title- Geothermal and Hydrocarbon Regimes, Northern Gulf of Mexico
Basin.

Author(s)- / Jones , Paul H. /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 15 , 83 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Auxiliary expression(s)-

Illus. / Figure (63) / Table (2) /

Ref.

Discuss.

Descriptor(s)- / Energy sources / Geochemistry / Geology /
Geopressured systems / Gulf of Mexico / Hydrocarbons /
Hydrodynamics / Maps / Petroleum / Salinity / Tables /
Temperature measurement / Thermal waters / Wells / Economic
geology / Natural gas / North / Resources / Abundance /
Exploration / Geopressure / Possibilities / Aerial geology /
Origin / Methane / Geothermal energy / Geo brine / Proceedings /
Geothermal resources / United States South /

Abstract by (Unknown)

Abstract by Author

Geothermal heat flow in the Gulf Basin is primarily a function of its hydrology. Water expelled from sediments with deepening burial and increasing overburden load escapes upward and toward the basin margin. Where it moves freely in the hydropressure zone, the basin is relatively cool; but where rapid sedimentation and contemporaneous faulting have retarded water loss from compacting sediments, the interstitial fluid pressure reflects a part of the overburden load and the formation waters are superheated and geopressured. The geopressured zone is common below depths of about 3 km (9,600 ft.) in the basin, beneath an area of 375,000 sq. km (150,000 sq. mi.), and extends downward perhaps 15 km (50,000 ft.) to the base of Cenozoic deposits. The upper boundary of the geopressured zone is the most important physical interface in the basin. Across it the head of formation water increases downward from a few hundred to several thousand feet above sea level; the geothermal gradient increases downward from 20 DEG to 40 DEG C/km to 100 DEG C/km or more; the salinity of formation water increases downward, commonly by 50,000 mg/l or more; and the porosity of shale and sand increases downward by 10 to 25 percent. Petroleum matures in geopressured clay at 140 DEG to 220 DEG F. Montmorillonite is dehydrated at 180 DEG to 250 DEG F; fresh water released may equal half the volume of the mineral altered. Molecular solubility in fresh water of the hydrocarbons in Gulf basin crude, under geopressured zone boundary could account for observed occurrences. This geopressured zone is a natural pressure vessel from which superheated water of moderate salinity could be produced through wells, each yielding millions of gallons a day at pressures of several thousand pounds per square inch, and temperatures above 300 DEG F, with considerable amounts of methane gas in solution.

444. GGIS-100004/0/ / /A/ / / / /

Title- Geothermal and Hydrodynamic Regimes in the Northern Gulf of Mexico Basin

Author(s)- / Jones , Paul H. /

Conference- Development and Utilization of Geothermal Resources

Publication date- 1975

Geopressured Geothermal Bibliography

Note- See Geothermics, Spec. Iss., No. 2, P. 14(20)

Auxiliary expression(s)-

Illus. / Figure (21) / Map (12) / Graph (8) / Drawing (1) /

Ref.

Descriptor(s)- / Gulf Coast / Hydrogeology / Ground water / North / Aquifers / Gulf of Mexico / Tectonics / Subsidence / Geopressure / Effects / Mass transfer / Systems / Geothermal / Hydrodynamics / Vertical tectonics / Uplifts / Faults / Crust / Loading / Sediments /

445. GGIS-100458/R/ / /M/ / / / /

Title- Geothermal Absorption Refrigeration for Food Processing Industries

(For Period 13 December 1976 - 13 November 1977)

Subtitle- Final Report

Author(s)- / Harris , R.L. / Olson , G.K. / Mah , C.S. / Bujalski , J.H. /

Publication date- November 1977

Pagination- 182 Pages

Report/patent- SAN/1319-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA). Div. of Geothermal Energy

EY-76-C-03-1319 /

Corporate Author- Aerojet Energy Conversion Co.

Sacramento , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (11) / Graph (12) / Map (1) /

Table

Ref.

Descriptor(s)- / Agriculture / Cost / Direct energy utilization / Economic analysis / Environmental impact / Food processing / Geothermal refrigeration / Geothermal resources / Market / Planning / Resource development / Site selection / Thermodynamic cycles / Working fluids /

Abstract by GGIS

Most of the food processing industry in the United States is located in the eleven western states. This concentration makes possible a saving in fossil fuel through direct utilization of the geothermal resource situated in the same region. The technical and economic feasibility of utilization of geothermal energy in the food processing industry is the subject of study. The absorption refrigeration thermodynamic cycle is described. The limitations of geothermal integration and its applicability to the food processing industry are studied. Environmental factors, economics, and market potential are analyzed. The project impact is evaluated, and a development plan is sketched.

446. GGIS-100407/O/ / /A/ / / / /

Title- Geothermal Application of Heat Exchanger Design for Desalination Plants

Author(s)- / Fritzler , Eugene A. / Coury , Glenn E. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 561 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Graph (3) /

Ref.

Descriptor(s)- / Analysis / Comparative evaluations / Cost / Data / Desalination / Design / Economics / Geothermal power plants / Heat exchangers / Heat transfer / Information needs / Performance / Reviews / Technology assessment /

Abstract by GGIS

Heat exchangers are expensive components in the geothermal electric or direct heat plant. Because so much information is available about heat exchangers, an analytical review of information published by the Office of Saline Water and the Oak Ridge National Laboratory was prepared for the U.S. Department of Energy. This paper considers a portion of that review, specifically, major technical design parameters and conclusions regarding vertical tube falling film and upward flow evaporators, horizontal tube spray film evaporators, and multistage flash plant condensers.

447. GGIS-100407/O/ / /A/ / / / /

Title- Geothermal Based Industrial Park Development in South Central Colorado

Author(s)- / Goering , Steven W. / Connor , Frances R. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Geopressured Geothermal Bibliography

Pagination- Page 565 , 3 Pages
Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts
Available- Geothermal Resources Council
P.O. Box 98
Davis
CA
95616
Local Availability- GGIS
Auxiliary expression(s)-
Illus. / Map (2) /
Table
Ref.
Descriptor(s)- / Agriculture / Colorado / Commercialization /
Development / Employment / Energy source development / Financing
/ Geothermal fields / Industry / Institutional aspects /
Management / Market / Site selection / Trade / Well drilling /
Well testing /
Abstract by GGIS

The Four Corners Regional Commission funds, and the Southern Colorado Economic District (SCEDD) administer a program to increase economic growth and employment by establishing a geothermal-based industrial park. Attracting business and industry is dependent upon completing four program objectives: 1) identification of potential sites on the basis of geothermal resource potential, ownership and leasing considerations, labor and materials availability, and transportation networks; 2) selection of geothermal energy users; 3) investigation into financing requirements; and 4) drilling geothermal test wells.

448. GGIS-100048/J/ / 1702/A/ / / / /

Title- Geothermal Conditions in Oil-Gas Regimes

Author(s)- / Afanas'yev , T. P. / Makarenko , F. A. / Pokrovskiy , V. A. /

Journal- Int. Geol. Rev.

Publication date- Vol. 17 , Issue 2 , 1975

Pagination- Page 164 , 3 Pages

Descriptor(s)- / USSR / Organic Materials / Petroleum / Economic geology / Hydrocarbons / Geochemistry / Gas / Oil and gas fields / Regional / Origin / P-T conditions / Correlation / Geopressure / Depth / Accumulation / Metamorphism / Temperature / Pressure buildup / Gas condensates /

449. GGIS-100445/R/ / /M/ / / / /

Title- Geothermal Direct Contact Heat Exchange

Subtitle- Final Report

Author(s)- / Sims , Anker V. /

Publication date- June 10 , 1976

Pagination- 113 Pages

Report/patent- SAN/1116-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Energy Research and Development Administration,
Washington, D.C. (USA). Div. of Geothermal Energy
EY-76-C-03-1116 /

Corporate Author- Holt (Ben) Co.

Pasadena , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (8) / Graph (9) / Photo (2) /
Table

Ref.

Descriptor(s)- / California / Computer calculations / Cost / Economic
analysis / Heat exchangers / Heat transfer / Hydrocarbons /
Laboratory equipment / Laboratory testing / Pilot plants / Power
generation / Solubility /

Abstract by Author

A glass direct contact heat exchange column was operated in the laboratory. The column was operated at atmospheric pressure using hot water and normal hexane. Column intervals tested included an empty column, sieve trays, disk-and-doughnut trays, and two types of packing. Operation was very smooth in all cases and the minimum temperature approaches varied from less than 1 deg C for packing to 13 deg C for the empty column. High heat transfer rates were obtained in all cases, however, columns should be sized on the basis of liquid and vapor traffic. The solubilities of hydrocarbons were determined for normal hexane, pentane and butane in water and sodium chloride and calcium chloride brines at various temperatures. The values seem to be internally consistent and salt content was found to depress hydrocarbon solubility. Laboratory stripping tests showed that gas stripping can be used to remove hydrocarbon from reject hot water from the direct contact heat exchange column. Although the gas volumes required are small, stripping gas requirements cannot be accurately predicted without testing. A computer program was used to study the effect of operating variables on thermodynamic cycle efficiencies. Optimum efficiencies for the moderate brine conditions studied were obtained with isopentane as working fluid and relatively low operating pressure. A preliminary design for a 50 MWe plant was prepared and plant capital cost and operating cost were estimated. These costs were combined with previously developed brine production and power transmission costs to provide an estimate of the cost of delivered power for a geothermal field at Heber, California. A pilot plant program is described that would be suitable for continuing the investigation of the direct contact process in the field. The program includes a suggested schedule and the estimated cost.

450. GGIS-100532/O/ / /A/ / / / /**Title- Geothermal Down-Well Pumping System**

Author(s)- / Matthews , Hugh B. / McBee , Warren D. /

Conference- Conference on Research for the Development of Geothermal
Energy Resources

Pasadena

CA (September 23 , 1974)

Geopressured Geothermal Bibliography

Publication date- December 31 , 1974
Pagination- Page 281 , 11 Pages
Local Availability- GGIS
Sponsor- / National Science Foundation /
Descriptor(s)- / Downhole pumps / Feasibility studies / Research
programs / Well testing /
Abstract by GGIS

The status and plan of a project to demonstrate the feasibility of a new approach to the problems of down-well pumping of geothermal liquid-dominated wells is described. That approach involves extracting energy from the hot well water downhole at the pump rather than the conventional method of bringing energy down from the surface to operate the pump.

451. GGIS-100995/ / / /A/ / / / /

Title- Geothermal Drilling and Completion Technology Development

Author(s)- / Varnado , S.G. / Stoller , H.M. /
Publication date- Vol. 2 , Issue 2 , 1978
Pagination- Page 675 , 4 Pages
Available- Geothermal Resources Council
P.O. Box 98
Davis
California
95616

Local Availability- CES
Corporate Author- Sandia Labs.
Albuquerque , New Mexico , USA

Auxiliary expression(s)-
Illus. / Graph (2) /
Ref.

Descriptor(s)- / Cost / Drilling equipment / Geothermal drilling /
Geothermal wells / Research programs / Well completion /

Abstract by Author

The high cost of drilling and completing geothermal wells is an impediment to the development of geothermal energy resources. Technological deficiencies of geothermal drilling techniques are evidenced when drilling geothermal wells. The Division of Geothermal Energy (DGE) of the U.S. Department of Energy has initiated a program aimed at developing new drilling and completion techniques for geothermal wells. The goals of this program are to reduce well costs by 25% by 1982 and by 50% by 1986. Sandia Laboratories has been selected to manage this technology development program, and this paper presents an overview of the program. Program justification which relates well cost to busbar energy cost and to DGE power-on-line goals is presented. Technological deficiencies in current rotary drilling techniques for geothermal wells are discussed. A program for correcting these deficiencies is described.

452. GGIS-100438/R/ / /M/ / / / /

Title- Geothermal Elastomeric Materials

Subtitle- Twelve-Months Progress Report for Period 1 October 1976
-- 30 September 1977
Author(s)- / Hirasuna , A. R. / Bilyeu , G. D. / Davis , D. L. /
Stephens , C. A. / Veal , G. R. /
Publication date- December 1977
Pagination- 93 Pages
Report/patent- SAN/1308-1
Available- NTIS
(Paper copy)
(Microfiche)
Local Availability- CES
Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
Geothermal Energy
EG-77-C-03-1308 /
Corporate Author- L'Garde, Inc.
Newport Beach , CA , USA
Auxiliary expression(s)-
Illus. / Diagram (24) / Photo (9) /
Table
Ref.
Descriptor(s)- / Comparative evaluations / Elastomers / Laboratory
testing / Materials testing / Seals / Simulation / Slurry packing
/
Abstract by Author

This 12-month Progress Report is a comprehensive description of work performed by L'Garde, Inc., on the GEM Program under ERDA Contract EG-77-C-03-1308. The objective of the first phase of the ERDA Elastomers Program is to develop elastomers for packer seal element applications which will survive downhole geothermal well chemistry at 260 deg C (500 deg F) for 24 hours. To achieve this development, a three level elastomer testing and evaluation program was established. The first level, Screening Tests, is a broad screening of potential candidates and with the end objective to filter out the more promising candidates for more expensive subsequent testing. The battery of tests include standard ASTM tests and a special test developed by L'Garde to test extrusion resistance using specimens all made from sheet stock. The second level or Simulation Tests provide a laboratory equivalent of downhole conditions using synthetic geothermal fluid. Full scale packer seals are tested under simulated operational conditions by a test fixture developed by L'Garde. The third level or In-Situ Tests which are currently in the planning, provide for testing the most favored materials in-situ in the geothermal well. A test module was designed by L'Garde which provides for testing of the specimen without interfacing with the well casing. A test module freely hanging on a wireline has much lower probability of causing a problem, such as becoming lodged in the well, as compared to an operational casing packer. This maximizes the number of wells (hence geothermal environments) where access can be gained and In-Situ Testing performed. During this period commercially available polymers were investigated. Most of the work centered around formulating peroxide cured Vitons and some on EPDMs, butyls, and resin cured Vitons. Of the formulations tested to date the EPDMs appear most promising and the peroxide cured Vitons next most promising. However, data is too sparse to make any firm conclusions at this time. Minor tasks were performed evaluating current commercially available elastomers used in oil tools and

Geopressured Geothermal Bibliography

conceptualization of casing packer for the geothermal application.

453. GGIS-100256/R/ / /M/ / / / /

Title- Geothermal Energy

(Special Study Guide No. 7)

Subtitle- A National Opportunity (The Federal Impact)

Publication date- 1978

Pagination- 157 Pages

Report/patent- NP--23437

Descriptor(s)- / Economics / Energy source development / Financial incentives / Geothermal exploration / Geothermal resources / Institutional aspects / Land leasing / Legal aspects / Ownership / Power generation / Regulations / Resource assessment / Taxes /

Abstract by GGIS

Separate abstracts were prepared for two presentations from this report.

454. GGIS-100246/R/ / /M/ / / / /

Title- Geothermal Energy

Subtitle- US Library of Congress Congressional Research Service Report IB74056

Author(s)- / Justus , John R. /

Publication date- September 1977

Pagination- 14 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Geothermal energy / Geothermal energy conversion / Legislation / Research programs / US ERDA /

Abstract by EIC

The primary application of geothermal resources is electric power generation. Methods of tapping this resource are described. The geothermal steam act of 1970 granted the Secretary of the Interior the authority to issue leases for developing geothermal resources on federal lands. The act, however, did not include any specific recommendations for R and D of geothermal resources. Geothermal legislation introduced in the 92-93 Congress tended toward this direction. Considerations, problems, and needs taken into account in the geothermal R and D legislation are summarized. In 1975, ERDA began a focused and fully coordinated national geothermal energy program. The overall goal of ERDA's geothermal R and D efforts is to assure that, by 1985, there will be a 20,000-30,000 MW commercial electric power generating capacity. ERDA programs involve: resource exploration and assessment; environmental, legal, and institutional constraints on geothermal development, resource utilization projects; and supportive research and technology to improve the state of the art of geothermal energy conversion facilities.

455. GGIS-100060/J/ / 6103/M/ // //

Title- Geothermal Energy

Subtitle- A Viable Resource

Author(s)- / Klostermeyer, William C. /

Journal- Reclamation Era

Publication date- Vol. 61, Issue 3, August 1975

Pagination- Page 6, 7 Pages

Corporate Author- U.S. Bureau of Reclamation

Descriptor(s)- / Geothermal energy / Desalination / Hot dry rock systems / Hot water / Steam / Imperial Valley / U.S. Bureau of Reclamation / Geo brine /

456. GGIS-100072/B/ / /M/ // //

Title- Geothermal Energy

(Federal Energy Administration Project Independence Blueprint
Final Task Force Report)

Publication date- November 1974

Pagination- 110 Pages

Available- US GPO

Washington, DC
20402

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (1) / Table (11) // U.S.
Federal Energy Administration / Geothermal energy / United
States West / Hot springs / Geysers / Financing / Power plants /
Data / Environmental impacts / Energy conservation / Oil
shortage / Economics /

Abstract by NTIS

The final technical analysis of the Project Independence Interagency Geothermal Task Force is presented. The Task Force was formed to estimate the production potential of the geothermal industry. It evaluated two different strategies: the first strategy, termed "business-as-usual", assumed the continuation of all current policies that could affect levels of geothermal production; and the second, called "accelerated demand", assumed selected changes in policies or practices that would allow a greater expansion of potential production. The U. S. geothermal resource base compares favorably with current oil and gas reserves. Development of geothermal resources, located mostly in the western third of the U. S., could considerably contribute to meeting U. S. power needs. Only one geothermal resource, dry steam, is presently utilized for power generation in the U. S. However, several other resource types appear favorable: brines, moderate temperature/low-salinity fluids, geopressured reservoirs, hot rock formations, and magmatic deposits. Private investment in these resources is estimated to be \$10 million for exploration, \$35 million for land leases, \$25 million for exploratory wells, and \$5 million for power plant and component technology. Major problems restricting the growth of geothermal energy include: (1) lack of confidence by major industrial energy users in geothermal reserves as reliable, long-term supplies of energy; (2) institutional,

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legal, and environmental problems; and (3) unsolved technical problems and economic uncertainties concerning use of geothermal energy in an environmentally acceptable manner. The recommended strategy would involve short-term governmental participation with the geothermal industry. The primary goal of the national geothermal energy program is to encourage the private sector to augment commercial production of electric power by 20,000-30,000 MW by 1965, thereby conserving the equivalent of 1 million BPD of oil. The national program is aimed at: (1) providing the necessary technology to improve the economics of geothermal power production; (2) expanding the knowledge of recoverable geothermal resources; and (3) resolving environmental, legal, and institutional problems. (1 diagram, 1 graph, 11 tables)

457. GGIS-100036/J/ / 304/A/ // //

Title- Geothermal Energy

Subtitle- A Hot Subject

Journal- Energies

Publication date- Vol. 1, Issue 4, September 1976

Pagination- Page 8, 3 Pages

Descriptor(s)- / Geothermal resources / Heat exchangers / Hot dry rock systems / Hot water systems / Power potential / Vapor dominated systems /

Abstract by ERDA/RECON

A brief discussion is given on the types of geothermal resources; dry steam, wet steam, hot dry rock, volcanoes and geopressured deposits. The downhole heat exchanger is pointed out as a promising means of tapping geothermal power more efficiently and cleanly. It is concluded that with proper encouragement, geothermal energy can be made available virtually anywhere on earth with the application of new technologies. (LBS)

458. GGIS-100407/O/ / /A/ // //

Title- Geothermal Energy

Subtitle- Basic Legal Parameters

Author(s)- / Wonstolen, Kenneth A. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9, 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4, 1980

Pagination- Page 661, 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasek W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA
95616

Local Availability- GGIS

Descriptor(s)- / Geothermal energy / Geothermal exploration /
Geothermal resources / Government policies / Land leasing / Laws
/ Leasing / Legal aspects / Legislation / Mineral rights /
Ownership / Planning / Public lands / Recommendations / Resource
development / Water rights /

Abstract by GGIS

Present natural resource laws and regulations may not be
suitable for application to geothermal resources, although these
laws and regulations may be useful as reference. State and
federal geothermal policies often rely upon water or mineral law
precedents; this action has received frequent criticism. In
establishing a legal framework for geothermal resources, the
first task is to define the resource and establish its
relationship to other natural resources. This task is begun by
discussing: definition requirements; ownership; relation to
water and water law; and access and allocation requirements.

459. GGIS-100127/R/ / /M/ / / / /

Title- Geothermal Energy

Subtitle- Residential Space Heating

Original Title- La Geothermie

Original Subtitle- Chauffage de Logements

Publisher- ERDA

Washington, D. C.

Publication date- March 1977

Pagination- 26 Pages

Report/patent- ERDA-TR-260

Available- US GPO

Washington, D. C.

20402)

Available- NTIS

(Paper copy)

(Microfiche)

Auxiliary expression(s)-

Illus. / Chart (3) / Diagram (7) / Graph (29) / Map (1) /

Descriptor(s)- / Climates / Computer codes / Cost benefit analysis /
Geothermal space heating / Heat exchangers / Heaters / Houses /
Optimization / Performance / Radiators / Simulation /

Abstract by Author

The purpose of this study, which was carried out under the
auspices of the DGRST, was to determine the best way to use
geothermal hot water for residential space heating. It quickly
became apparent that the type of heating apparatus used in the
housing units was most important and that heat pumps could be a
valuable asset, making it possible to extract even more
geothermal heat and thus substantially improve the cost benefit
of the systems.

Many factors play a significant role in
this problem. Therefore, after a first stage devoted to
analyzing the problem through a manual method which proved quite
useful, the systematic consideration of all important aspects
led us to use a computer to optimize solutions and process a

large number of cases. The software used for this general study can also be used to work out particular cases: it is now available to any interested party through DGRST. This program makes it possible to 1) take climatic conditions into account in a very detailed manner, including temperatures as well as insolation. 864 cases corresponding to 36 typical days divided into 24 hours each were chosen to represent the heating season. They make it possible to define the heating needs of any type of housing unit. 2) Simulate and analyze the behavior in practice of a geothermal heating system when heat is extracted from the well by a simple heat exchanger. This simulation makes it possible to evaluate the respective qualities of various types of heating apparatus which can be used in homes. It also makes it possible to define the best control systems for the central system and substations and to assess quite accurately the presence of terminal controls, such as radiators with thermostatically controlled valves. 3) Determine to what extent the addition of a heat pump makes it possible to improve the cost benefit of geothermal heating. When its average characteristics and heating use conditions (price, coefficient of performance, length of utilization, electrical rates, etc.) are taken into account, the heat pump should not be scaled for maximum heating power. Consequently, the program considers several possible sizes, with different installation schemes, and selects for each case the value which corresponds to the lowest cost of heating.

460. GGIS-100239/J/ / /A/ / / / /

Title- Geothermal Energy

Subtitle- Its Promise for the Future

Journal- Ground Water Age

Publication date- Vol. 12 , Issue 1 , September 1977

Pagination- 3 Pages

Auxiliary expression(s)-

Illus. / Graph (1) / Photo (1) /

Descriptor(s)- / Cost / Forecasting / Geopressure resources /
Geopressured systems / Geothermal power plants / Geothermal
resources / Hot springs / Hydrothermal systems / Louisiana /
Power potential / Public utilities / Texas /

Abstract by EIC

The present status and potential of geothermal energy resources are examined. Several estimates of geothermal capacity are made as a measure of the state of the geothermal art. The hydrothermal resource associated with hot springs having temperatures above 150 DEG C in the western states is about 15,000 MW for 100 years. Some 6000 MW/100 YR of geothermal capacity are available, most in a few large systems, at a capital cost of from \$600-950/KW for both plant and reservoir development. In addition to the western hydrothermal resource, the Texas and Louisiana coastal geopressured region holds about 24,000 MW/100 YR of potential capacity in hot water. Geothermal power plant costs are estimated. Energy firms and utilities are discussed in terms of current geothermal R and D projects and in light of their influence on such developments.

461. GGIS-100239/J/ / /A/ / / / /

Title- Geothermal Energy

Subtitle- It's Hot Stuff

Journal- Ground Water Age

Publication date- Vol. 12 , Issue 1 , September 1977

Pagination- Page 26 , 4 Pages

Auxiliary expression(s)-

Illus. / Drawing (1) / Map (2) /

Descriptor(s)- / Energy source development / Geopressured systems /
Geothermal resources / Hot water systems / Hydrothermal systems
/ Magma systems / Power potential / USA / Vapor dominated systems
/

Abstract by EIC

A gap exists between the potential U.S. geothermal resources and the developed geothermal capacity. Potential steam and hot water geothermal energy that could be tapped by known methods is 46,000 MW, while developed geothermal resources are 502 MW, all belonging to the Pacific Gas and Electric Co., Calif. The different physical forms of geothermal energy are considered, including dry steam, hot water, geopressured systems, and hot igneous material. Locations of major developed and undeveloped geothermal sources are given, and type of development is noted briefly.

462. GGIS-100305/R/ / /M/ / / / /

Title- Geothermal Energy

Subtitle- A National Proposal for Geothermal Resources Research

Author(s)- / Hickel , W.J. /

Conference- Geothermal Resources Research Conference

Seattle

Washington

USA (September 18 , 1972)

Journal- Geothermal Resources Research Conference

Publication date- September 18 , 1972

Pagination- 95 Pages

Report/patent- PB-222326

Available- NTIS

(Paper Copy)

(Microfiche)

Corporate Author- Battelle Seattle Research Center

Seattle , Washington , USA

Descriptor(s)- / Commercialization / Energy source development /
Economics / Environmental effects / Financing / Geothermal
exploration / Geothermal reservoirs / Geothermal resources /
Institutional aspects / Production / Research programs /
Resource assessment /

Abstract by TIC

This report presents the results of the Geothermal Resources Research Conference held in September, 1972. The importance of geothermal resources to the nation is discussed first, followed by budget recommendations for research on geothermal resources and an overview of geothermal resources. Reports of the six

Geopressured Geothermal Bibliography

conference panels are included: Resource Exploration; Resource Assessment; Reservoir Development and Production; Utilization Technology and Economics; Environmental Effects; and Institutional Considerations. The report concludes with a summary of research needs and an extensive bibliography.

463. GGIS-100277/J/ / /A/ / / / /

Title- Geothermal Energy

Author(s)- / Zraly , Arthur J. /

Journal- Energy Rep. CHASE

Publication date- August 1976

Pagination- 4 Pages

Auxiliary expression(s)-
Table

Descriptor(s)- / California / Energy source development / Economics /
Electric power / Geopressure resources / Geysers geothermal
field / Hot dry rock systems / Hot water systems / Imperial
Valley / Power generation / Steam / Vapor dominated systems /

Abstract by Energyline

Special report: Dry steam, hot water, geopressured, and hot dry rock geothermal resources are explained, and the economics of developing these alternative energy sources are weighed. A geothermal generating station is less efficient than one fueled by oil is. The dry steam reservoir at the Geysers, Calif., is expected to have 1800 MW installed by 1985. Imperial Valley in southern California is one of the largest and most studied hot water fields in the U.S. The hope is to produce 200 MW by 1985. Experienced forecasters say geothermal systems will provide 3000 Mw of power by 1985--less than 1% of total electric generation available at that time.

464. GGIS-100033/J/ / 2901/A/ / / / /

Title- Geothermal Energy

Subtitle- A Look into the Future

Author(s)- / Benson , W. Alan /

Journal- Earth Science

Publication date- Vol. 29 , Issue 1 , January 23 , 1976

Pagination- Page 22 , 5 Pages

Auxiliary expression(s)-
Ref.

Descriptor(s)- / Geothermal resources / Geothermal energy / Steam /
Hot water / Geo brine / Hot dry rock systems / Water pollution /
Land subsidence /

Abstract by Energyline

If 10% of the geothermal energy trapped in the upper 2 mi. of the earth's crust were extracted, it would provide 58,000 MW/Yr. for 50 years. Vapor- and liquid-dominated geothermal systems, geopressurized basins, hot and dry rock formations, and near-normal thermal gradient environments all have energy potential. Although geothermal energy has proved to be cost-effective, there are several implementation problems. The

history of geothermal energy and factors that have spurred its recent development are summarized. (14 referneces)

465. GGIS-100357/R/ / /M/ / / / /

Title- Geothermal Energy and the Eastern U. S.:

Subtitle- A Scenario for Geothermal Energy Development, the Eastern Gulf Coastal Plain

Publication date- February 1978

Pagination- 59 Pages

Report/patent- APL/JHU/QM-77-129-3

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Corporate Author- Johns Hopkins Univ.

Applied Physics Lab.

Laurel , Maryland , USA

Auxiliary expression(s)-

Illus. / Map (4) /

Table

Ref.

Descriptor(s)- / Alabama / Energy source development / Florida /
Forecasting / Geopressed reservoirs / Gulf Coast /
Hydrothermal systems / Mississippi / Resource assessment /

Abstract by Author

This brief report explains and discussess a scenario for the development of potential geothermal resources in the Eastern Gulf Coastal Plain states of Mississippi, Alabama, of the potential applications and energy market in this region are given. A ranking of the resources as to their energy content, potential market, etc., is described, and the assumptions and strategy used to generate the scenario are discussed. A more complete report on the detailed aspects involved in the preparation of the development scenario will be issued in the near future.

466. GGIS-100042/J/ / /A/ / / / /

Title- Geothermal Energy and the Food Industry, South Louisiana

Author(s)- / Arnold , Alanson J. /

Publication date- Vol. 7 , Issue 2 , February 1979

Pagination- Page 22 , 7 Pages

Auxiliary expression(s)-

Illus. / Map (1) / Figure (4) /

Descriptor(s)- / Aquifers / Environmental effects / Food products /
Geopressed reservoirs / Louisiana / Uses /

467. GGIS-100309/R/ / /A/ / / / /

Title- Geothermal Energy and the Food Industry, South Louisiana

Author(s)- / Arnold , Alanson J. /

Geopressed Geothermal Bibliography

Conference- Direct Utilization of Geothermal Energy : A Symposium

San Diego

California

USA (January 31 , 1978)

Publication date- January 31 , 1978

Pagination- Page 111 , 9 Pages

Report/patent- CONF--780133

Local Availability- CES

Auxiliary expression(s)-

Illus. / Map (1) / Diagram (1) /

Descriptor(s)- / Food processing / Geopressed reservoirs /
Geothermal space heating / Industrial plants / Louisiana /
Methane / Power generation / Process heat / Uses /

Abstract by Energyline

The potential of geothermal energy resources in southern Louisiana for application to the food processing industry is assessed. Large geopressed aquifers exist both onshore and offshore in Louisiana, and have suitable characteristics for use in the food industry. Food products that could be prepared using geothermal energy processes are listed, including cane sugar, alcohol, cotton seed oil, and prepared fish and seafood products. Geothermal energy also could be used for power generation, drying, and dehumidifying in food processing plants. Technical problems that need to be solved include coordinating the timing of geothermal supply and demand, and transporting the energy.

468. GGIS-100289/R/ / /M/ / / / /

Title- Geothermal Energy and the Land Resource

Subtitle- Conflicts and Constraints in the Geysers - Calistoga KGRA

Author(s)- / O'Banion , Kerry / Hall , Charles /

Publication date- July 14 , 1980

Pagination- 34 Pages

Report/patent- UCRL-52970

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Livermore Lab.

Livermore , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Map (9) /

Ref.

Descriptor(s)- / Agriculture / Communities / Comparative evaluation /
Energy source development / Ecology / Environmental impacts /
Exploitation / Geothermal energy conversion / Geysers geothermal
field / Hydrology / KGRAs / Land use / Public lands / Regional
analysis / Regulatory guides / Socio-economic factors / Uses /
Zoning /

Abstract by Author

This study of potential land-related impacts of geothermal power development in The Geysers region, one component of the Lawrence

Livermore National Laboratory (LLNL)/Lawrence Berkeley National Laboratory (LBNL) socioeconomic program, focuses on Lake county because it has most of the undeveloped resource and the least regulatory capability. We first characterize the land resource in terms of its ecological, hydrological, agricultural, and recreational value; intrinsic natural hazards; and the adequacy of roads and utility systems. Based on those factors, we identify the potential land-use conflicts and constraints that geothermal development may encounter in the region and determine the availability and relative suitability of land for such development. We conclude with a brief review of laws and powers germane to geothermal land-use regulation. The material in this study will be dovetailed with economic and demographic forecasts, now in preparation, in a combined final report in late 1980. The final report will include a more detailed analysis of potential socioeconomic impacts and land-use outcomes, as well as an evaluation of policy options to mitigate adverse impacts.

469. GGIS-100213/R/ / /M/ / / / /

Title- Geothermal Energy and the Law

Subtitle- I. The Federal Lands Management Program

Author(s)- / Stone, C. D. / McNamara, J. /

Publication date- September 30, 1975

Pagination- 287 Pages

Report/patent- NSF-RA-S--75-050

Available- National Science Foundation

Washington, D. C.

Local Availability- CES (R C280)

Sponsor- / NSF/RANN

Aer 7509194 /

Corporate Author- University of Southern California
Law Center

Los Angeles, California, USA

Descriptor(s)- / By-products / Energy policy / Geothermal energy /
Geothermal exploration / Government policies / Institutional
aspects / Land leasing / Land use / Laws / Leases / Leasing /
Legal aspects / Licensing / Ownership / Regulations / Uses /
Water rights /

Abstract by EAPA

A broad range of problems in the legal and institutional environment which hampers the development of the geothermal industry is discussed. The topics include: the development of geothermal energy; pre-leasing procedures-- public vs. private assessment; exploratory permits and related strategies; the rate of geothermal leasing--past and future; compensation strategies; lessee qualifications; lands available for leasing; noncompensatory lease terms; ongoing leasehold and production requirements; problems of "secondary" geothermal uses; and water law conflicts. (LBS)

470. GGIS-100384/R/ / /M/ / / / /

Title- Geothermal Energy as a Source of Electricity

Geopressured Geothermal Bibliography

Subtitle- A Worldwide Survey of the Design and Operation of
Geothermal Power Plants
Author(s)- / DiPippo, Ronald /
Publication date- January 1980
Pagination- 370 Pages
Report/patent- DOE/RA/28320-1
Available- Superintendent of Documents
U.S. Government Printing Office
Washington
DC
USA
20402
(Paper copy)
Local Availability- CES
Sponsor- / Department of Energy, Washington, DC (USA). Div. of
Geothermal Energy
AS02-76ET28320 /
Corporate Author- Brown Univ.
Providence, RI, USA
Auxiliary expression(s)-
Illus. / Diagram (89) / Photo (42) / Graph (7) / Map (23) /
Table
Ref.
Descriptor(s)- / China / Economics / Electric power / Environmental
effects / Geological setting / Geopressure resources /
Geothermal energy conversion / Geothermal exploration /
Geothermal fields / Geothermal fluids / Geothermal power plants
/ Iceland / Italy / Japan / Mexico / New Zealand / Performance /
Philippines / Turkey / USA / USSR / Wells /
Abstract by Author
A worldwide survey of all existing geothermal,
electricity-producing installations up to July 1979 is
presented. A brief introduction to the types of geothermal
resources and energy conversion systems is given. The
geological characteristics of each plant are discussed. The
discussion is arranged by country. The survey is intended to
have broad appeal, particularly among energy planners.

471. GGIS-100151/P/ / /M/ / / / /

Title- Geothermal Energy from Salt Formations

Author(s)- / Altschuler, S. J. /
Publication date- October 11, 1977
Pagination- 8 Pages
Report/patent- 4,052,857 (U. S. Patent
Note- Filed Data 6 October 1976 to Dow Chemical Co.
Auxiliary expression(s)-

Illus. / Figure (7) /
Claim

Descriptor(s)- / Geothermal energy / Heat exchangers / Heat
extraction / Patents / Pipes / Salt deposits /

Abstract by ERA

A method is described for obtaining geothermal energy from
salt formations in which a well is drilled and cased into a
suitable salt formation to a depth where the temperature is such

that the salt behaves plastically. A weighted, closed end pipe is inserted into the well with its lower, closed end at about the bottom of the salt formation. Thereafter an insulated open end pipe is inserted, after the weight has been removed from the closed end pipe, within the closed end pipe, thus forming a double pipe heat exchanger. A heat exchange fluid is circulated, usually in a closed loop, through the double pipe heat exchanger, an energy extracting means, such as, for example, a steam generator or an hydraulic turbine, and back through the heat exchanger.

472. GGIS-100995/ / / /A/ / / / /

Title- Geothermal Energy Direct Applications Market-Estimator Model

Author(s)- / Metzger, S.W. /

Publication date- Vol. 2, Issue 2, 1978

Pagination- Page 437, 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Table

Descriptor(s)- / Commercialization / Direct energy utilization /
Economics / Geothermal energy / Market / Mathematical models /

Abstract by Author

The subject model, which can best be described as a marketing economics tool, was conceived on the premise that a "quick and dirty" estimation technique often provides an acceptable degree of perception into the basic character of a market. This rather superficial calibration of a market could be considered in lieu of the data a more expensive, in-depth investigation would produce. The value of this market-estimator model will be dependent, however, upon the resources available to the researcher. Moreover, the model's value will be contingent upon the desired quality of data upon which a decision, either preliminary or final, will be based. The model is ideal for those situations which depict limited study resources and permit "order-of-magnitude" assessments.

473. GGIS-100328/R/ / /A/ / / / /

Title- Geothermal Energy Executive Summary

Publication date- Vol. 2, June 30, 1976

Pagination- Page 117, 35 Pages

Auxiliary expression(s)-

Illus. / Diagram (9) /

Table

Descriptor(s)- / Budgets / Demonstration programs / Energy source
development / Economics / Environmental effects / Geopressured
systems / Geothermal resources / Hot water systems / Magma
systems / Research programs / Resource assessment /

Geopressured Geothermal Bibliography

Socio-economic factors / Technology assessment / Vapor dominated systems /

Abstract by Energyline

A comprehensive federal energy geothermal program to develop geothermal resources as an economically, environmentally, and socially acceptable energy option is presented. The geothermal resources considered include dry steam, hot water, geopressured water, hot dry rock, thermal gradients in the Earth's crust, and magma. The latest assessment of the nation's geothermal resources estimates a total energy content in the first four types in excess of 400,000 quads; the energy content of the latter two is, in theory, almost limitless. Due to the strong influence on commercial scale development of geothermal resources of regional and local factors, the federal government hopes to work closely with state and local governments and with local industry and environmental groups in identifying appropriate methods of geothermal resource recovery.

474. GGIS-100519/R/ / /M/ / / / /

Title- Geothermal Energy Geopressure Subprogram

Publication date- February 1981

Pagination- 203 Pages

Report/patent- DOE/EA-0134

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Descriptor(s)- / Environmental impact statements / Fluids /
Geopressured systems / Government policies / Planning /
Production testing / Productivity / Regulations / Socio-economic
factors / Testing / Well drilling /

Abstract by NTIS

The proposed action will consist of drilling one geopressured-geothermal resource fluid well for intermittent production testing over the first year of the test. During the next two years, long-term testing of 40,000 BPD will be flowed. A number of scenarios may be implemented, but it is felt that the total fluid production will approximate 50 million barrels. The test well will be drilled with a 22 cm (8.75 in.) borehole to a total depth of approximately 5185 m (17,000 ft). Up to four disposal wells will provide disposal of the fluid from the designated 40,000 BPD test rate. The following are included in this assessment: the existing environment; probable environmental impacts-direct and indirect; probable cumulative and long-term environmental impacts; accidents; coordination with federal, state, regional, and local agencies; and alternative actions.

475. GGIS-100584/R/ / /M/ / / / /

Title- Geothermal Energy Geopressure Subprograms, Gladys McCall Well Site, Cameron Parish, Louisiana

Publication date- 1981

Report/patent- DOE/EA-0134
 Available- NTIS
 Corporate Author- Department of Energy
 Div. of Geothermal Energy
 Washington, D.C. , USA
 Descriptor(s)- / Cameron Parish / Environmental impact statements /
 Gladys McCall No. 1 Well / Louisiana / Research programs /
 Testing / Well testing /

 476. GGIS-100420/R/ / /M/ / / /

Title- Geothermal Energy Impact in Brazoria County
 Subtitle- Final Report for the Period July 15, 1978 to November 30, 1979
 Author(s)- / Horine , Bill /
 Publication date- June 1980
 Pagination- 22 Pages
 Report/patent- DOE/ET/27032-1
 Available- NTIS
 (Paper copy)
 (Microfiche)
 Local Availability- CES
 Sponsor- / Department of Energy, Washington, D.C. (USA)
 AS08-78ET27032 /
 Corporate Author- Alvin Community College
 TX , USA
 Descriptor(s)- / Brazoria County / Communities / Education / Energy
 source development / Exploratory wells / Geopressed systems /
 Meetings / Planning / Pleasant Bayou No. 1 Well / Public opinion
 / Public relations / Social impact / Socio-economic factors /
 Texas /
 Abstract by Author

All activities performed by Alvin Community College and the University of Texas at Austin in association with the development of geopressed-geothermal energy are contained in this report. A discussion of the progress of the test well is also contained herein. Public seminars and workshops were presented to the local community. A summer institute in energy was also presented to local public school teachers. A campaign to publicize the development of the new energy resource was also waged. An overall evaluation of the project is also attached.

 477. GGIS-100164/J/ / /A/ / / /

Title- Geothermal Energy Plant
 Author(s)- / Wilson , J. S. /
 Journal- Chem. Eng. Prog.
 Publication date- Vol. 73 , Issue 11 , November 1977
 Pagination- 4 Pages
 Descriptor(s)- / Calculation methods / Cost / Diagrams / Economics /
 Geopressed systems / Geothermal fluids / Geothermal power
 plants / Injection wells / Methane / Natural gas deposits /
 Planning / Reservoir rocks / Turbomachinery /
 Abstract by DOE/RECON

Geopressed Geothermal Bibliography

Results are presented of research works, done by both government and private industry, on the conceptual design of a plant to produce both electric power and natural gas, plus calculations of the economics of such an undertaking. It is demonstrated that geopressed, geothermal reservoirs appear to have potential as sources of electrical power. However, for the power to compete economically, the water must contain large volumes of recoverable methane, temperatures must be above 300 DEG F, reservoirs must be large, and well flow must be quite large. Should all these criteria be met, geopressed geothermal electricity should be a technical and economic possibility.

478. GGIS-100238/J/ / /A/ / / / /

Title- Geothermal Energy Potential in Western United States

Author(s)- / Pryde, Phillip R. /

Journal- J. Geography

Publication date- Vol. 76, Issue 5, September 1977

Pagination- Page 170, 5 Pages

Auxiliary expression(s)-

Illus. / Map (1) / Photo (2) /

Ref.

Descriptor(s)- / Geothermal energy / Power potential / Technology assessment / USA /

Abstract by EIC

Although geothermal energy has a high energy ratio, it must overcome numerous problems before it becomes commercially feasible. Certain technical problems, such as scaling and reinjection, must be addressed by ERDA and other researchers. While increased costs of traditional energy supplies, especially natural gas and imported oil, enhance the importance of continued research on geothermal energy sources, the support through private investment of ERDA loans and subsidies provides the most promising approach to R and D with practical applications. Further research can probably resolve environmental problems satisfactorily.

479. GGIS-100225/R/ / /M/ / / / /

Title- Geothermal Energy Prospects for the Next 50 Years

Publication date- February 1978

Pagination- 92 Pages

Report/patent- EPRI-ER--611-SR

Corporate Author- Electric Power Research Inst.

Palo Alto, California, USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Map (4) /

Table

Ref.

Descriptor(s)- / Energy source development / Direct energy utilization / Environmental effects / Forecasting / Geothermal industry / Geothermal energy conversion / Geothermal resources / Power potential /

Abstract by TIC

Three facets of geothermal energy--resource base, electric power potential, and potential nonelectric uses-- are considered, using information derived from three sources: (1) analytic computations based on gross geologic and geophysical features of the earth's crust, (2) the literature, and (3) a worldwide questionnaire. Discussion is presented under the following section headings: geothermal resources; electric energy conversion; nonelectric uses; recent international developments; environmental considerations, and bibliography. (JGB)

480. GGIS-100279/R/ / /M/ / / / /

Title- Geothermal Energy Research, Development and Demonstration Program Definition Report

Publication date- 1975

Pagination- 73 Pages

Report/patent- ERDA-86

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Corporate Author- U.S. Department of Energy

Geothermal Energy Div.

Washington , D.C. , USA

Descriptor(s)- / Commercialization / Energy source development / Economics / Geopressed sytems / Geothermal energy / Geothermal exploration / Hot dry rock systems / Hydrothermal systems / Industry / Magma systems / Socio-economic factors /

Abstract by GGIS

The goal for the National Geothermal Energy Development Program is to achieve a utilization of geothermal energy equivalent to one million barrels of oil per day by 1985. The objective of the Federal Government program is to stimulate industry by creating favorable conditions for making the necessary commitment. This project stressed the discovery and development of hydrothermal systems in meeting the 1985 goal. Geopressed systems were also considered. In addition, the project considered the advancement of the technology and the development of hot dry rock, normal temperature gradient and magma systems to enable geothermal energy use after 1985. Nontechnological issues received particular attention because they are presently the major factors inhibiting rapid growth of geothermal exploration. Actions to overcome both technological and nontechnological impediments were evaluated.

481. GGIS-100011/O/ / /A/ / / / /

Title- Geothermal Energy Resources

(Group Position Paper, 3 Subgroup Papers, and 1 Review Paper)

Author(s)- / Kruger , Paul /

Conference- Magnitude and Deployment Schedule of Energy Resources

Publication date- September 1975

Geopressured Geothermal Bibliography

Pagination- Page 59 , 6 Pages

Report/patent- CONF--750720-

Descriptor(s)- / Desalination / Environmental effects / Exploration /
Forecasting / Geological surveys / Geopressured systems /
Geothermal energy / Geothermal resources / Hot dry rock systems /
Hot water systems / Legal aspects / Materials recovery / Planning
/ Production / Space heating / USA / Energy resources /

Abstract by ERDA/RECON

Geothermal energy may be considered to be the thermal energy contained in the upper 10 KM. of the earth's crust, which has a mean temperature gradient between 20 to 30 degrees C/KM, a mean emissive heat flux of about 1.5 degrees CAL/CM(SQ) SEC, and a heat content above 15 DEG C of some 3×10^{26} CAL, of which about 6×10^{24} U CAL is under the United States. This resource base is equivalent to the heat content of 8×10^{14} metric tons of coal or 5×10^{18} , representing about 375,000 times the forecasted U.S. total electric power production for the year 1985. Unfortunately, geothermal heat in the outer 10 KM of the earth's crust is too diffuse to be exploitable as an energy resource on a worldwide basis. Resources suitable for commercial exploitation may be defined as localized geologic deposits of heat concentrated at attainable depths, in confined volumes, and at sufficient temperatures for intended utilization. Although geothermal resources have been developed largely for generation of electric power, utilization of geothermal resources for non-electrical purposes such as space or industrial heating, desalination of water, and mineral recovery may be of great value in conserving fossil and nuclear fuels. Environmental impacts of geothermal energy are discussed. Legal problems associated with geothermal resources vary from state to state. Three subgroup papers include: wet and dry steam systems, by David L. Williams; hot dry rock systems, by William E. Brigham; and geopressured systems, by Myron Dorfman. A review of geothermal energy resources was presented by Geoffrey Robson. (MCW)

482. GGIS-100995/ / / /A/ / / / /

Title- Geothermal Energy Resources:

Subtitle- Exploration Budget and Costs Recovery

Author(s)- / Takashima , Ronald T. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 643 , 2 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Table

Descriptor(s)- / Budgets / Cost / Geothermal energy / Geothermal
exploration /

Abstract by Author

Increasing costs of geothermal exploration have made it a
necessity that program managers be adequately trained to collect

and analyze budgetary data. Exploration budgets should be used to monitor and control dollar expenditures. Furthermore, the program manager must properly utilize the available geothermal exploration techniques with an adequate economic and technical analysis of the acquired data in order to provide a supported determination to continue each exploration venture. Finally, appropriate utilization of cost information should allow geothermal exploration management to make proper decisions as to cost control and calculations of cost recovery.

483. GGIS-100278/J/ / /A/ / / / /

Title- Geothermal Energy--

Subtitle- The Hot Prospect

Journal- Aware

Publication date- Issue 81, June 1977

Pagination- Page 2, 6 Pages

Descriptor(s)- / Cost / Energy source development / Economics /
Electric power / Geopressured resources / Geothermal power
plants / Geothermal resources / Geysers geothermal field / Magma
/ Power generation / Steam /

Abstract by Energyline

The potential capacity of U.S. geothermal resources is about 450,000 MW/day--just a little less than the total U.S. generating capacity today. Developed geothermal capacity, however, stands in distinct contrast: 502 MW, all of it belonging to the Pacific Gas & Electric Co. at the Geysers in California. Dry steam system, hot water, geopressured systems, and crystalline rock and magma are methods of exploiting geothermal power that are waiting to be tapped. The rationale for costing available geothermal resources is complex, but among the major elements are power plant costs of from \$400-650/KW.

484. GGIS-100402/R/ / /M/ / / / /

Title- Geothermal Energy, Research, Development & Demonstration Program

Publication date- March 1979

Pagination- 166 Pages

Report/patent- DOE/ET-0090

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Corporate Author- Interagency Geothermal Coordinating Council
Washington, D.C. , USA

Auxiliary expression(s)-

Illus. / Diagram (7) / Photo (2) / Graph (6) / Map (6) / Figure (5) /
Table

Descriptor(s)- / Availability / Comparative evaluations / Cost /
Demonstration programs / Economics / Energy policy / Energy
source development / Geopressure resources / Gulf Coast /

Geopressured Geothermal Bibliography

Institutional aspects / Leasing / Legislation / Planning /
Research programs / Resource assessment / Resource potential /
Abstract by GGIS

Progress in the federal geothermal energy program during fiscal year 1978 is summarized. The structure and function of the IGCC are described. The USGS Circular 790, "Assessment of Geothermal Resources of the United States -- 1978" is discussed. An outline of the federal geothermal development strategy and program is presented, along with plans for fiscal year 1979. Developments in each of the four geothermal regions -- Pacific, Rocky Mountain Basin and Range, Gulf Coast, and Eastern United States -- are discussed. A brief history of geothermal legislation is presented. A sample site-specific development plan is set forth. Legal, financial, institutional and international aspects of geothermal development are discussed.

485. GGIS-100389/R/ / /M/ / / / /

Title- Geothermal Energy, Research, Development and Demonstration Program

Subtitle- Fourth Annual Report

Publisher- U.S. Department of Energy, Assistant Secretary for
Resource Applications
Washington, D.C., 20461

Publication date- June 1980

Pagination- 187 Pages

Report/patent- DOE/RA-0050

Available- NTIS

(Paper copy)
(Microfiche)

Local Availability- GGIS

Corporate Author- Interagency Geothermal Coordinating Council
Washington, D.C. , USA

Auxiliary expression(s)-

Illus. / Diagram (13) / Graph (2) / Map (3) /
Table

Descriptor(s)- / Demonstration plants / Demonstration programs /
Development / Direct energy utilization / Economics / Electric
power / Energy policy / Environmental policy / Exploitation /
Geopressure resources / Geothermal industry / Geothermal wells /
Leasing / Planning / Research programs / Resource potential /
Socio-economic factors / Technology utilization /

Abstract by GGIS

Progress during Fiscal Year 1979 and near-term plans of the federal government for promoting the use of geothermal energy are discussed. The IGCC goals for geothermal production are presented. Geothermal development by the private sector is increasing, but an aggressive federal program is needed to ensure that the specific goals are met. Coordination of federal, state, and private sector planning has improved, and recent technological advances have reduced the cost and risk associated with geothermal development. Geothermal energy is currently economically competitive at many sites, and on the verge of being so at other sites, but environmental, legal, and socioeconomic constraints may impose impediments on development at certain sites. The federal geothermal plan, utilization goals,

estimates, and resource potential, and the program for commercialization, technology development, and international activities are described. Environmental developments, regional, state, and local government accomplishments, status, and plans, and industry activity are discussed.

486. GGIS-100261/R/ / /M/ / / / /

Title- Geothermal Energy, Research, Development and Demonstration Program

Subtitle- Second Annual Report

Publication date- April 1978

Pagination- 162 Pages

Report/patent- IGCC-3

Available- NTIS

(Paper Copy)

(Microfiche)

Corporate Author- U.S. Department of Energy

Geothermal Energy Div.

Washington , D.C. , USA

Descriptor(s)- / Alaska / Arizona / California / Colorado / Commercialization / Demonstration programs / Financing / Geopressured systems / Geothermal energy / Geothermal exploration / Geothermal power plants / Geothermal resources / Geothermal wells / Hawaii / Hot dry rock systems / Idaho / Louisiana / Management / Maps / Montana / Nevada / Oregon / Planning / Research programs / Tables / Technology assessment / Texas / USA / Utah / Well drilling / Wyoming /

Abstract by TIC

The discussion is presented under the following section headings: Executive summary; national geothermal utilization estimates; federal geothermal energy program objective; federal geothermal energy strategy; federal program planning, implementation, and progress monitoring; organization of the report; national progress and achievements; regional progress and accomplishments; fiscal year 1978 activities; federal program activities in fiscal year 1979 and beyond; Appendix A--Interagency coordination and program management interagency geothermal coordinating council (IGCC); and Appendix B--International activities.

487. GGIS-100362/R/ / /M/ / / / /

Title- Geothermal Energy:

Subtitle- Obstacles and Uncertainties Impede Its Widespread Use

Publication date- January 18 , 1980

Pagination- 41 Pages

Report/patent- PB 80-134430

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Corporate Author- General Accounting Office

Energy and Minerals Div.

Geopressured Geothermal Bibliography

Washington , D. C. , USA
Descriptor(s)- / Energy source development / Geothermal energy /
Government policies / Institutional aspects / Regulations /
Research programs / Uses /

Abstract by Author

This report discusses the obstacles and uncertainties impeding the widespread use of geothermal energy. It includes a perspective on geothermal energy's development and potential, and a discussion of Federal actions needed to help accelerate geothermal development and use.

488. GGIS-100308/O/ / /M/ / / / /

Title- Geothermal Energy:

(2. Volume, 1. Section)

Subtitle- A Novelty Becomes Resource

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- 385 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

489. GGIS-100371/R/ / /M/ / / / /

Title- Geothermal Environmental Impact Assessment:

(Final Report)

Subtitle- Ground Water Monitoring Guidelines for Geothermal Development

Author(s)- / Weiss , Richard B. / Coffee , Theodora O. / Williams , Tamata L. /

Publication date- September 1979

Pagination- 232 Pages

Report/patent- PB 80-144801

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Environmental Protection Agency

68-03-2668 /

Corporate Author- Harding-Lawson Asso.

San Rafael , California , USA

Auxiliary expression(s)-

Illus. / Figure (41) /

Table

Ref.

Descriptor(s)- / Aquifers / Artificial recharge / Corrosion / Costs / Fluids / Geothermal systems / Ground subsidence / Ground water / Hot water systems / Injection wells / Liquid wastes / Monitoring / Plugging / Reservoir engineering / Rock properties / Scaling / Seismicity / Vapor dominated systems / Waste disposal / Well logging /

Abstract by Author

The proposed ground water monitoring methodology for geothermal development specifies a six-step planning and evaluation procedure as follows: (1) define baseline conditions and project development; (2) forecast aquifer conditions; (3) define limits of detection; (4) evaluate ground water and disposal facility monitoring techniques; (5) design monitoring plan and alternatives; (6) implement monitoring plan. A philosophy of prevention is emphasized as an integral, natural and essential component of the monitoring methodology. Natural geothermal processes and reservoir development are discussed from the point of view of their effects on ground water systems. A liquid-dominated field will produce a far greater volume of effluent than a vapor-dominated field. Most geothermal reservoirs exhibit fracture porosity. They may consist of many separate pockets of fluids at various depths and with varying degrees of hydraulic connection. The relationship between shallow ground water, deep ground water and the geothermal system must be known in order to assess potential degradation. Borehole logging techniques provide continuous and detailed vertical profiles of rock and fluid properties. These can be used for ground water monitoring in geothermal areas to define baseline conditions, construct wells and monitor observation and injection wells. Well logging techniques cannot be directly applied to the fractured, crystalline environment typical of geothermal reservoirs since the standard calibration and interpretation methods have been developed for the intergranular, sedimentary petroleum environment. Currently, the most effective disposal method for liquid waste is injecting it into subsurface strata. Injection is also beneficial in that it helps prevent subsidence and facilitates reservoir recharge. Before injection of liquid wastes is initiated, geologic, hydrologic and reservoir engineering evaluations must be conducted. Potential problems may be chemical (e.g., scaling, formation plugging, corrosion) or physical (induced seismicity, hydrofracturing, thermal stress). Actual injection experience is summarized, along with costs and areas of the technology needing research and development.

490. GGIS-100179/0/ / // // //

Title- Geothermal Environmental Seminar

Publication date- 1975

Pagination- Page 156

Report/patent- CONF-7511133

491. GGIS-100153/0/ / /A/ // //

Geopressured Geothermal Bibliography

Title- Geothermal Exploration of Presidio County, Trans-Pecos, Texas

Author(s)- / Kopp , R. A. /

**Conference- 11th Annual Meeting of the Geological Society of America,
South-Central Section**

El Paso

Texas

USA (March 17 , 1977)

Publication date- Vol. 9 , January 1977

Pagination- Page 31 , 2 Pages

Corporate Author- Texas University, El Paso

El Paso , Texas , USA

**Descriptor(s)- / Geothermal exploration / Hot springs / Presidio
County / Reservoir temperature / Subsurface waters / Temperature
surveys / Thermal waters / Trans-Pecos hot rocks /**

Abstract by ERA

Over 250 water samples from springs and wells have been collected in Presidio County. Three broad areas within the county contain a total of 13 wells or springs having surface temperatures from 30 to 72 DEG C; these areas include: (1) Candelaria, (2) south of Marfa, and (3) near Ruidoso. Based on the silica geothermometer a total of 138 samples show subsurface reservoir temperatures equal to or greater than 100 DEG C. The hottest areas occur north and south of Candelaria and south of Marfa where subsurface temperatures are estimated to exist from 125 to 177 DEG C. Current studies are aimed at defining the extent of the hot water areas, determine the relationship of the hot waters to the geology of the area, and analyze the chemistry of the waters.

492. GGIS-100153/0/ / /A/ / / / /

Title- Geothermal Exploration Program

Subtitle- Trans-Pecos, Texas

Author(s)- / Hoffer , J. M. /

**Conference- 11th Annual Meeting of the Geological Society of America,
South-Central Section**

El Paso

Texas

USA (March 17 , 1977)

Publication date- Vol. 9 , January 1977

Pagination- Page 26 , 1 Pages

Corporate Author- Texas University, El Paso

El Paso , Texas , USA

**Descriptor(s)- / Brewster County / Culberson County / El Paso County /
Geochemical surveys / Geothermal exploration / Hudspeth County /
Jeff Davis County / Presidio County / Reservoir temperature /
Surface temperature / Temperature surveys / Thermal waters /
Texas / Trans-Pecos hot rocks / Water analysis /**

Abstract by ERA

A program to evaluate the geothermal potential of a six county area in West Texas was recently initiated. The region of study includes approximately 22,000 square miles in El Paso, Culberson, Hudspeth, Jeff Davis, Presidio and Brewster Counties. The first year program includes geological and geochemical studies in an attempt to locate and define the occurrence of natural hot waters. To date over 700 water samples

have been collected. Forty-five spring or well samples show surface temperatures ranging from 30 to 72 DEG C. These warm to hot water occurrences are found in twelve different areas of the region. Based on the silica geothermometer approximately 250 springs and wells have reservoir temperatures of at least 100 DEG C. In addition to silica, each water sample has been analysed for sodium, potassium, calcium, lithium, fluoride, choride, magnesium plus numerous metals. Geological studies include detailed surface mapping in the immediate area of selected hot water localities plus the construction of a regional geologic map showing the locations of major structures and igneous rock occurrences.

493. GGIS-100256/R/ / /A/ / / / /

Title- Geothermal Fuels Comparison with Other Fuels

(Paper 10 in Geothermal Energy- A National Opportunity (the Federal Impact))

Author(s)- / Greider , B. /

Publication date- 1978

Pagination- 19 Pages

Report/patent- NP--23437

Descriptor(s)- / Coal / Comparative evaluations / Cost / Economics / Fossil fuels / Fuels / Geothermal energy / Natural gas / Petroleum / Power generation /

494. GGIS-100042/J/ / /A/ / / / /

Title- Geothermal Geopressure Resources and Problems of the Gulf Coast

Author(s)- / Romans , W.A. /

Publication date- Vol. 1 , Issue 1 , August 1973

Pagination- 14 Pages

Descriptor(s)- / Diagrams / Geology / Geophysical surveys / Geopressured systems / Geothermal energy / Geothermal resources / Gulf of Mexico / Hydrology / Methane / Pressure dependence / Shores / Steam / Temperature dependence / Water /

495. GGIS-100241/O/ / /A/ / / / /

Title- Geothermal Leasing Practices

Author(s)- / Kitchen , G. J. /

Conference- Geothermal Resources Development Institute Conference
Salt Lake City

Utah

USA (January 27 , 1977)

Publisher- Rocky Mountain Mineral Law Foundation
Boulder, CO

Publication date- January 27 , 1977

Pagination- 38 Pages

Report/patent- CONF-770135--

Geopressured Geothermal Bibliography

Descriptor(s)- / Energy source development / Geothermal resources /
Land leasing / Leasing / Legal aspects /

Abstract by TIC

A general overview of the resource is presented to the extent the subject bears on leasing practices. Some legal and practical problems involved in developing the resource are discussed. Finally, a hypothetical land situation is described and some suggestions are made for leasing geothermal resources on the described premises. (MHR)

496. GGIS-100240/J/ / /A/ / / / /

Title- Geothermal Leasing Practices

Author(s)- / Kitchen , Gerald J. /

Journal- Land Water Law Review

Publication date- Vol. 13 , Issue 1 , 1977

Pagination- Page 25 , 35 Pages

Descriptor(s)- / Energy source development / Geothermal resources /
Land leasing / Leasing / Legal aspects /

Abstract by EIC

No one is quite sure what the geothermal resource is, so the question of who owns it is open to doubt. Few prospective lessors have any understanding of the resource in general or any knowledge of how development might impact their land. Legal and practical problems involved in developing the geothermal resource are discussed. A hypothetical land situation illustrates leasing premises.

497. GGIS-100407/O/ / /A/ / / / /

Title- Geothermal Market Penetration in the Residential Sector

Subtitle- Capital Stock Impediments and Compensatory Incentives

Author(s)- / Goodman , Allen C. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal
Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 715 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasel W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Sponsor- / Johns Hopkins Univ., Laurel, MD (USA). Applied Physics Lab.

/

Auxiliary expression(s)-

Illus. / Graph (1) /

Ref.

Descriptor(s)- / Capital / Commercialization / Comparative evaluations / Conversion / Cost / Efficiency / Equations / Financial incentives / Geothermal heating / Heating / Market / Mathematical models / Residential buildings / Simulation /

Abstract by GGIS

In considering conversion to a geothermal heating system, the homeowner faces two related costs: capital conversion costs and system hookup costs. This paper looks at the implications these costs have on geothermal market expansion. A model used for analysis shows that market penetration is a function of the age of the existing furnace, the differential in the efficiency of the two systems (existing vs. geothermal), and the conversion costs. It has been determined that a sizeable efficiency differential (at least 60%) may be necessary to offset the costs of conversion. It is possible, also, to use the model to calculate a set of incentive payments that would persuade the homeowner to convert to a geothermal heating system.

498. GGIS-100232/J/ / /A/ / / / /

Title- Geothermal Power Emerging as an Alternate Energy Source

Author(s)- / Austin, Ward H., JR. /

Journal- Can. Min. J.

Publication date- Vol. 98, Issue 10, October 1977

Pagination- Page 361, 3 Pages

Auxiliary expression(s)-

Illus. / Drawing (4) /

Table

Descriptor(s)- / Europe / Geothermal energy / Geothermal energy conversion / Italy / Japan / South America / USA /

Abstract by EIC

Geothermal energy as an alternate energy source is examined. Part of the delay in the development of geothermal energy in the U. S. is related to the argument over the assignment of royalties in the event of commercial production. The Italian, U. S., Japanese, South American, and French approaches to geothermal energy are surveyed. By the year 2000, 30,000 MW of geothermal energy could be installed in the U. S. if bureaucratic problems are solved. In Japan, extensive geothermal exploration is underway, and it is expected that, by 1982, Japan's geothermal electrical production should be up from the current 70 MW to 1000 MW. Japan is aiming at establishing 50,000 MW of geothermal generating capacity by the year 2000.

499. GGIS-100367/R/ / /M/ / / / /

Title- Geothermal Power Production:

Subtitle- Impact Assessments and Environmental Monitoring

Author(s)- / Layton, David W. / Pimentel, Kenneth D. /

Conference- 26 Annual Meet., Institute for Environmental Sciences

Philadelphia

Pennsylvania

Geopressured Geothermal Bibliography

USA (May 11 , 1979)
Publication date- January 1980
Pagination- 7 Pages
Report/patent- UCRL-83681
Available- NTIS
(Paper Copy)
(Microfiche)
Local Availability- CES
Sponsor- / U. S. Department of Energy
W-7405-ENG-48 /
Corporate Author- California Univ., Livermore
Lawrence Livermore Lab.
Livermore , California , USA
Auxiliary expression(s)-
Illus. / Diagram (1) / Map (1) /
Ref.
Descriptor(s)- / Air quality / California / Environmental effects /
Geothermal energy conversion / Ground subsidence / Imperial
Valley / Models / Monitoring / Power generation / Seismicity /
Water quality /
Abstract by Author
This paper focuses on the role that baseline and postoperational
environmental monitoring plays in assessing impacts of
geothermal power production. Based on our experience in the
Imperial Valley, where substantial geothermal resources exist,
we examine the important characteristics of monitoring programs
involving subsidence, seismicity, and air and water quality. We
discuss the importance of environmental monitoring for
situations where predictive models either do not exist (e.g.,
seismicity), or are still being developed (e.g., land
subsidence). In these cases we emphasize the need for acquiring
and analyzing data that can provide timely information on
changes caused by geothermal operations. Monitoring is also
useful in verifying predictions of air quality changes--in
particular, violations of ambient standards after control
technologies are implemented. Water quality can be monitored
with existing sampling programs where the potential for
geothermal impacts is thought to be rather small. We summarize
the significant issues in these environmental areas, the status
of baseline data and predictive capability that currently
exists, and the need for future monitoring and modeling programs
to assess the impacts of geothermal development.

500. GGIS-100899/0/ / /A/ / / / /

Title- Geothermal Powered Heat Pumps to Produce Process Heat
Author(s)- / Neill , D.T. / Jensen , W.P. /
Conference- 11 Intersociety Energy Conversion Engineering Conference
Pagination- Page 802 , 6 Pages
Report/patent- SAE--769139
Descriptor(s)- / Cost / Elevated temperature / Flashed steam systems /
Geothermal fluids / Heat exchangers / Power plants / Process heat
/ Uses / Working fluids /
Abstract by Author
Most geothermal electrical power generating facilities will
produce tremendous volumes of hot water having residual heat at a

temperature of 100 to 150 DEG C. Such heat is difficult to utilize economically but it becomes much more usable if a heat pump is employed to raise the temperature of a portion of the residual heat to significantly higher temperatures. An attractive scheme for such a system employs a two-stage flash steam generator in which steam from the first stage goes to the heat pump compressor as working fluid and steam from the second stage is used to power a turbine which in turn drives the compressor. Calculations have been performed on such a system which delivers process heat via the working fluid at temperatures of 150 DEG C to 260 DEG C from geothermal resource temperatures of 100 DEG C to 150 DEG C. Cost studies show that the heat pump system can deliver process heat at costs competitive with the use of fossil fuel heaters.

501. GGIS-100013/O/ / 31/M/ // //

Title- Geothermal Projects and Estimates Through 1985 and the Year 2000

(Paper SPE 5397)

Author(s)- / Glass , W. A. /

Conference- Society of Petroleum Engineers of AIME Regular Meeting

Publication date- Issue 5397 , 1975

Pagination- Page 57 , 6 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Geothermal energy / Steam /

Abstract by NTIS

This paper examines various current and future aspects of geothermal energy production and utilization. The contribution of geothermal energy to the total present U.S. energy needs is 410 MWE, or an amount of energy equivalent to less than 0.1% of U.S. daily oil consumption. If this very small output is to be significantly increased, an "accelerated" program ought to be implemented through speeded research and development, and removal of institutional, regulatory, and legal, environmental, and technological constraints. This would lead to an estimated output of 20,000 MWE by 1985 and 200,000 by the year 2000. The geothermal projects that will contribute to this growth include dry steam fields, hot brines, moderate temperature/ low salinity fluids, geopressed reservoirs, hot dry rock and magmatic deposits. 1 ref.

502. GGIS-100245/O/ / /M/ // //

Title- Geothermal Research and Advanced Technology

Author(s)- / La Mori , Phillip /

Conference- 3rd Energy Technology Conf.

Washington, D. C., USA (March 29 , 1976)

Publication date- 1976

Pagination- Page 103 , 12 Pages

Auxiliary expression(s)-

Illus. / Graph (6) /

Ref.

Geopressured Geothermal Bibliography

Table

Descriptor(s)- / Commercialization / Energy source development /
Exploitation / Forecasting / Geothermal energy conversion /
Technology assessment / Technology utilization / Vapor dominated
systems /

Abstract by EIC

Technology for the commercialization of vapor-dominated hydrothermal geothermal systems is demonstrated. Near-term utilization of geothermal energy in the U. S. is dependent on several factors: accurate evaluation of the resource base; predictions of growth in utilization; risks as perceived by utilities and how these will affect growth; institutional issues; economic issues; and environmental problems. Previous estimates of the growth of geothermal electric power production are examined, and it is found that all but the most conservative are too high for 1985. The present estimate for 1985 is less than 4000 MWE installed. As the available hydrothermal convective systems become more developed, significant inputs from the hot igneous and geopressure systems will be necessary to maintain the established growth rate.

503. GGIS-100042/J/ / 310/A/ / / / /

Title- Geothermal Reservoir Engineering

Author(s)- / Takahashi , P. K. / Chen , B. /

Journal- Geothermal Energy Magazine

Publication date- Vol. 3 , Issue 10 , 1975

Pagination- Page 7 , 15 Pages

Descriptor(s)- / Tables / Diagrams / Photographs / Reservoir
engineering / Hot-dry rocks / Vapor dominated systems /
Geopressured systems / Forecasting / Power generation / Well
logging / Aquifer tests / Reviews / Structural models /

504. GGIS-100533/O/ / /A/ / / / /

Title- Geothermal Reservoir Insurance Program

Subtitle- Evaluation of Alternatives and Assessment of Needs

Author(s)- / Golabi , Kamal /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 374 , 6 Pages

Local Availability- GGIS

Corporate Author- Woodward-Clyde Consultants
San Francisco , CA , USA

Auxiliary expression(s)-
Ref.

Descriptor(s)- / Cost benefit analysis / Development / Economic
analysis / Energy source development / Financial incentives /
Financing / Geothermal resources / Investment / Operation /
Planning / Production / Productivity / Resource assessment /
Resource depletion / Resource development / Risk assessment /

Abstract by GGIS

This is a review of insurance methods aimed at reducing the financial risks in geothermal development to both the users of geothermal energy and its developers. Included is an assessment of insurance needs and an evaluation of alternative schemes.

505. GGIS-100407/O/ / /A/ / / / /

Title- Geothermal Reservoir Modeling

Subtitle- A Review of Approaches

Author(s)- / Castanier , Louis / Sanyal , Subir K. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 313 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Comparative evaluations / Economics / Evaluation /
Forecasting / Geothermal reservoirs / Mathematical models /
Mathematics / Models / Performance / Planning / Simulation /
Statistical models /

Abstract by GGIS

Geothermal reservoir modeling is one step in the planning phase of geothermal activity. Modeling is necessary for planning the development and use of a geothermal resource; modeling also is required for economic planning. A discussion of the several approaches (empirical, analytical, semi-analytical, numerical) commonly used in reservoir modeling, their advantages and limitations, is provided in this article. Given the budget, extent and quality of the data, and the purpose of the model, the model approach will differ with respect to the specific geothermal resource. This review should facilitate decision making concerning the choice of an appropriate model.

506. GGIS-100532/O/ / /A/ / / / /

Title- Geothermal Reservoir Simulation

Author(s)- / Mercer , James W. / Pinder , George F. /

Conference- Conference on Research for the Development of Geothermal Energy Resources

Pasadena

Geopressured Geothermal Bibliography

CA (September 23 , 1974)
Publication date- December 31 , 1974
Pagination- Page 256 , 12 Pages
Local Availability- GGIS
Auxiliary expression(s)-
Illus. / Graph (1) / Ref. (21) /
Descriptor(s)- / Computerized simulation / Equations / Geothermal
reservoirs / Mathematical models / Simulation /
Abstract by GGIS

Numerical simulation is used to address the problems of predicting long-term geothermal reservoir performance and the environmental effects of exploiting the resource. Multiphase energy transport, energy transport in fractured porous reservoirs, well bore phenomena and subsidence are simulated.

507. GGIS-100290/ / / /A/ / / / /

Title- Geothermal Resource Assessment and Cost of Geothermal Power
Author(s)- / Leardini , T. /
Conference- 10. World Energy Conference (Energy Resources:
Availability and Rational Use)
Istanbul
Turkey (September 19 , 1977)
Publisher- IPC Science and Technology Press
Guildford, England
Publication date- Vol. 10 , September 1977
Pagination- Page 126 , 1 Pages
Note- Abstract only
Local Availability- Eng.
Descriptor(s)- / Cost / Economics / Electric power / Geopressured
systems / Hot dry rock systems / Magma systems / Power generation
/ Resource assessment / Vapor dominated systems /
Abstract by Compendex

The assessment of geothermal energy is based on a careful definition and evaluation of thermal energy resources and reserves in different systems which can be schematically subdivided into convection systems (vapor dominated and steam-dominated), geopressurized systems, hot dry rock systems and magmatic systems. Major attention is attached to the steam-dominated fields, delivering steam or steam and water mixtures, which can be utilized to generate electricity in conventional low-pressure steam power-plant equipment. Although, generally speaking, there is rather scarce knowledge of the potential involved in single systems, recent work has been devoted in many countries to resource assessment and is dealt with in the first part of this paper. The economic evaluation of the power produced by geothermal fluids is analyzed in the second part. Updated capital costs involved in the different phases of geothermal resource exploitation are reviewed, including prospection, drilling, steam collection, power plant and electrical equipment and installation. Methods are suggested for the evaluation of energy costs, according to prevailing local capital and labor costs, etc.

508. GGIS-100411/0/ / 1/A/ / / / /

Title- Geothermal Resource Utilization

Subtitle- Paper and Sugar Cane Industries

Author(s)- / Hornburg , C. D. /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 233 , 28 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Auxiliary expression(s)-

Illus. / Figure (13) / Graph (5) / Map (3) / Drawing (5) /

Table

Ref.

Descriptor(s)- / Cost / Energy sources / Geopressured systems /
Geothermal energy / Geothermal resources / Gulf of Mexico /
Industrial plants / Industry / Paper / Refining / Stores / Sugar
cane / Uses / Geo brine / Geothermal heating / Texas / Louisiana
/ Energy consumption / Proceedings / 206 (SIC) / 261-3 (SIC) /
Paper pulp / Paper board /

Abstract by ERDA/RECON

The feasibility of utilizing geothermal resources of the
geopressured zone along the Gulf of Mexico Coast in the pulp and
paper industry and sugar cane industry was studied. A summary
of the findings is presented, which includes energy
requirements, specific plants and sites, diagrams of main
processes, energy-recovery system, waste disposal and
economics. The overall conclusion of the study is that
utilization of thermal energy from the geoenergy fluid in pulp
and paper mills and new sugar refineries is technically sound and
economically viable, provided that the other energy in the fluid
(natural gas and pressure) is recovered concurrently. (LS)

509. GGIS-100159/R/ / /M/ / / / /

Title- Geothermal Resources

(Geological Circular 76-3)

Subtitle- Frio Formation, Upper Texas Gulf Coast

Author(s)- / Bebout , D. G. / Loucks , R. G. / Bosch , S. C. /
Dorfman , M. H. /

Pagination- 48 Pages

Report/patent- NP-22439

Available- Bureau of Economic Geology

University of Texas at Austin

University Station

BOX X

Austin

Texas

Geopressured Geothermal Bibliography

78712

(Paper copy)

Corporate Author- Texas University, Austin

Bureau of Economic Geology

Austin , Texas , USA

Auxiliary expression(s)-

Illus. / Cross section (5) / Diagram (3) / Map (29) /

Ref.

Table

Descriptor(s)- / Brazoria County / Deposition / Distribution / Frio Formation / Galveston County / Geologic cross sections / Geopressure resources / Growth faults / Gulf Coast / Isothermal maps / Salt domes / Sand / Sand percent maps / Subsurface temperatures / Electric logging / Geologic structures / Geopressured systems / Geothermal exploration / Gulf of Mexico / Isotherm / Maps / Shales / Temperature measurement / Tertiary Period / Texas / Well logging / Wells /

Abstract by DOE/RECON

Major sand trends were identified in the Frio Formation, Upper Texas Gulf Coast as part of the evaluation of its potential for producing geothermal energy. Electrical logs from 465 wells spaced 55 to 10 miles apart were used in the study. Maps illustrating total net sand and total sand percentage of the Frio Formation are included. It was found that subsurface fluid temperatures of greater than 250 DEG F occur in the Frio Sand bodies up to 100 FT thick downdip of the high-sand trends. A broad band in Brazoria and Galveston Counties was delineated as having geothermal potential.

510. GGIS-100062/J/ / 191/A/ / / / /

Title- Geothermal Resources

Subtitle- A New Look

Author(s)- / Hammond , A. L. /

Journal- Science

Publication date- Vol. 190 , Issue 4213

Pagination- Page 370

Descriptor(s)- / Geothermal resources / Resource assessment / Hydrothermal systems / Geopressured systems / Hot dry rock systems / Magma systems /

511. GGIS-100086/ / / /M/ / / / /

Title- Geothermal Resources

(University of Texas Geological Circular 75-8)

Subtitle- Frio Formation, Middle Texas Gulf Coast

Author(s)- / Bebout , D. G. / Agagu , O. K. / Dorfman , M. H. /

Publication date- 1975

Pagination- 43 Pages

Corporate Author- University of Texas

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Geothermal resources / Texas / Geothermal energy / Geo brine / Methane /

Abstract by Energyline

The geothermal resources of the Frio Formation in the middle Texas Gulf Coast area are evaluated. At depths generally greater than 7000 FT the sands and shales of the Frio Formation are overpressured and undercompacted. The insulating effect of these sediments results in the accumulation of subsurface heat, and, thus, high temperature water. The geopressured zone's resource consists of high temperature water with relatively low salinity and with dissolved methane gas. The following areas are investigated: depositional environments; and the geopressured zone and its relationship to sand-shale distribution, growth faults, and fluid temperatures. (Numerous maps)

512. GGIS-100087/R/ / /M/ / / / /

Title- Geothermal Resources

Subtitle- Frio Formation, South Texas

Author(s)- / Bebout , D. G. / Dorfman , M. H. / Agagu , O. K. /

Publication date- 1975

Pagination- 36 Pages

Report/patent- T1D--26955

Available- NTIS

(Paper copy)

(Microform)

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin , Texas , USA

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Texas / Geological surveys / Distribution / Geologic deposits / Faults / Geopressured systems / Geothermal resources / Sand / Seismic surveys / Site selection / Methane /

Abstract by Energyline

Due to prospective oil wells that penetrated the Tertiary sediments, a geopressured zone containing fluids with high temperatures exists along the Texas Gulf Coast. Limited data indicate that pore spaces within the sands in this zone are filled with water high in temperature, relatively low in dissolved solids, and saturated with methane gas. These waters are considered an important potential source of methane gas and thermal energy. A preliminary study of one of the two main sand trends (the Frio Formation), its sand distribution, and formation temperatures and pressures was undertaken to define prospective areas needing a detailed reservoir analysis prior to selection of a geothermal well site. (Numerous diagrams, numerous maps)

513. GGIS-100474/R/ / /M/ / / / /

Title- Geothermal Resources

(A Bibliography)

Subtitle- Exploration & Exploitation

Publication date- March 1975

Geopressured Geothermal Bibliography

Pagination- 208 Pages

Report/patent- TID-3354

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Corporate Author- Energy Research and Development Administration

Technical Information Center

Oak Ridge , TN , USA

Descriptor(s)- / Bibliographies / By-products / Consumption rates /
Economics / Energy consumption / Engineering / Environmental
effects / Geothermal exploration / Geothermal power plants /
Geothermal resources / Regulations /

Abstract by Author (revised)

To aid the industrial and scientific community concerned with geothermal resource exploration and development, a major portion of the scientific and technical information published on this subject has been cataloged, indexed, and stored in machine readable form. The bibliography is comprehensive, but not complete: references are being added on a continuing basis and will be available on the Department of Energy's on-line computer retrieval system, RECON. References are arranged in broad subject categories. Within a given category the arrangement is chronological.

514. GGIS-100241/0/ / /A/ / / / /

Title- Geothermal Resources

(An Alternative Energy Source which is Gathering Steam)

Subtitle- Water and Other Conflicts Encountered by the Developer

Author(s)- / Vranesh , G. / Musick , J. D., JR. /

Conference- Geothermal Resources Development Institute Conference

Salt Lake City

Utah

USA (January 27 , 1977)

Publisher- Rocky Mountain Mineral Law Foundation

Boulder, CO

Publication date- January 27 , 1977

Pagination- 66 Pages

Report/patent- CONF-770135--

Descriptor(s)- / Colorado / Energy source development / Geothermal
resources / Laws / Legal aspects / Legislation / Mineral rights /
Water rights /

Abstract by TIC

Geothermal resources are described briefly. Various environmental, legal, and technical obstacles are reviewed. Federal and state legislation and case law that might affect geothermal development if the resource is treated as either mineral or water are outlined. The treatment of geothermal resources in one jurisdiction, Colorado, is summarized, and possible legal solutions necessary to meet a goal of fuel sufficiency that is prudently accountable both environmentally and technologically are summarized. (MHR)

515. GGIS-100240/J/ / /A/ / / / /

Title- Geothermal Resources

(An Alternative Energy Source which is "Gathering Steam")

Subtitle- Water and Other Conflicts Encountered by the Developer

Author(s)- / Vranesh , George / Musick , John D., JR. /

Journal- Land Water Law Review

Publication date- Vol. 13 , Issue 1 , 1977

Pagination- Page 109 , 41 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Colorado / Energy source development / Geothermal resources / Laws / Legal aspects / Legislation / Mineral rights / Water rights /

Abstract by EIC

Various environmental, legal, and technical obstacles to developing geothermal resources are described. Federal and state legislation and case law that might affect geothermal development if the resource is treated as mineral or water are reviewed. Treatment of geothermal resources in Colorado is described. The need is to accommodate a new kind of water with existing rights systems.

516. GGIS-100043/J/ / 2/A/ / / / /

Title- Geothermal Resources of the Northern Gulf of Mexico Basin

(Published Maps Show Little Potential, Deep Drilling Shows High Geopressures, Geothermal Gradients)

Author(s)- / Jones , Paul H. /

Journal- Geothermics

Publication date- Vol. 2 , 1970

Pagination- Page 14 , 13 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Gulf Coast / Geothermal energy / Thermal waters / Heat flow / Faults / Ground water / Economic geology / Distribution / Movement / Regional / Possibilities / Resources / Temperature / Geopressure / Depth / Geothermal gradient / Heat sources / Clay / Dehydration / Drilling / Fresh water / Geopressured systems / Geothermal resources / Gulf of Mexico / Maps / Temperature gradients /

517. GGIS-100172/R/ / /M/ / / / /

Title- Geothermal Resources of the Texas Gulf Coast

(Geological Circular 76-7)

Subtitle- Environmental Concerns Arising from the Production and Disposal of Geothermal Waters

Author(s)- / Gustavson , Thomas C. / Kreidler , Charles W. /

Publication date- 1976

Pagination- 40 Pages

Report/patent- NP-21775

Geopressured Geothermal Bibliography

Available- Bureau of Economic Geology
University of Texas at Austin
University Station
Box X
Austin
Texas
78712

(Paper copy)

Local Availability- GGIS

Corporate Author- Texas University, Austin
Bureau of Economic Geology
Austin, Texas, USA

Auxiliary expression(s)-

Illus. / Graph (8) / Map (15) /

Ref.

Table

Descriptor(s)- / Chemical composition / Environmental effects /
Faults / Geopressured systems / Geothermal fluids / Ground
subsidence / Gulf of Mexico / Regulations / Texas / Transport /
Waste disposal / Water chemistry / Erosion / Fault activation /
Floods / Gulf Coast / Hazards / Hurricanes / Reservoir compaction
/ Saline aquifers / Storage / Storms / Waste water / Water
production / Wind /

Abstract by TIC

Disposal and temporary surface storage of spent geothermal fluids and surface subsidence and faulting are the major environmental problems that could arise from geopressured geothermal water production. Geopressured geothermal fluids are moderately to highly saline and may contain significant amounts of boron. Disposal of hot saline geothermal water in subsurface saline aquifers will present the least hazard to the environment. It is not known, however, whether the disposal of as much as 54,000 cubic M of spent fluids per day into saline aquifers at the production site is technically or economically feasible. If saline aquifers adequate for fluid disposal cannot be found, geothermal fluids may have to be disposed of by open watercourses, canals, pipelines to coastal bays on the Gulf of Mexico. Overland flow or temporary storage of geothermal fluids may cause negative environmental impacts. As the result of production of large volumes of geothermal fluid, reservoir pressure declines may cause compaction of sediments within and adjacent to the reservoir. The amount of compaction depends on pressure decline, reservoir thickness, and reservoir compressibility. The magnitude of environmental impact of subsidence and fault activation varies with current land use. Geothermal resource production facilities on the Gulf Coast of Texas could be subject to a series of natural hazards: (1) hurricane- or storm-induced flooding, (2) winds from tropical storms, (3) coastal erosion, or (4) expansive soils. None of these hazards is generated by geothermal resource production, but each has potential for damaging geothermal production and disposal facilities that could, in turn, result in leakage of hot saline geothermal fluids.

518. GGIS-100241/O/ / /M/ / / / /

Title- Geothermal Resources Development Institute Conference
 Conference- Geothermal Resources Development Institute Conference
 Salt Lake City
 Utah
 USA (January 27 , 1977)
 Publisher- Rocky Mountain Mineral Law Foundation
 Boulder, CO
 Publication date- January 27 , 1977
 Report/patent- CONF-770135--
 Abstract by TIC
 Fourteen papers and a bibliography are presented. A separate abstract was prepared for each. (MHR)

 519. GGIS-100241/O/ / /A/ / / / /

Title- Geothermal Resources Joint Ventures
 Author(s)- / Schlauch , P. J. /
 Conference- Geothermal Resources Development Institute Conference
 Salt Lake City
 Utah
 USA (January 27 , 1977)
 Publisher- Rocky Mountain Mineral Law Foundation
 Boulder, CO
 Publication date- January 27 , 1977
 Pagination- 23 Pages
 Report/patent- CONF-770135--
 Descriptor(s)- / Agreements / Geothermal resources / Legal aspects /
 Abstract by TIC
 An attempt is made to identify and analyze the more important of the differences between joint ventures in oil and gas and those in geothermal resources. Matters that should receive special attention in structuring a geothermal resource joint venture are discussed.

 520. GGIS-100240/J/ / /A/ / / / /

Title- Geothermal Resources Joint Ventures
 Author(s)- / Schlauch , Paul J. /
 Journal- Land Water Law Review
 Publication date- Vol. 13 , Issue 1 , 1977
 Pagination- Page 13 , 24 Pages
 Auxiliary expression(s)-
 Ref.
 Descriptor(s)- / Agreements / Geothermal resources / Legal aspects /
 Abstract by EIC
 Joint venturing for geothermal resources is not radically different from the more familiar mining and oil and gas joint ventures. However, differences are sufficient to merit special consideration, and the more important ones are identified and analyzed. Ultimately, the success of a geothermal resource joint venture will depend on the good faith of participants much more than on the language chosen to define the agreement.

521. GGIS-100250/R/ / /M/ / / / /

Title- Geothermal Resources, Vicksburg Formation, Texas Gulf Coast

Author(s)- / Loucks , R. G. /

Publication date- January 1978

Pagination- 54 Pages

Report/patent- ORO--4891-2

Corporate Author- Texas University, Austin

Bureau of Economic Geology

Austin , Texas , USA

Descriptor(s)- / Deliverability / Geopressure resources /
Geopressured reservoirs / Gulf Coast / Hidalgo County /
Permeability / Resource availability / Sandstone / Texas /
Vicksburg Formation /

Abstract by TIC

The potential for discovering geopressured geothermal reservoirs in the Vicksburg Formation is limited to Hidalgo County along the lower Texas Gulf Coast. In Hidalgo County, an area of approximately 385 square miles (designated the Vicksburg Fairway) contains up to 1,300 feet of geopressured sandstones with fluid temperatures greater than 300 DEG F. In-place effective permeability, however, averages less than 1 millidarcy in the Vicksburg Sandstones because of fine grain size and extensive late carbonate cementation. Also, areal extent of individual reservoirs is limited in a dip direction by growth faults and in a strike direction by the lenticular morphology of the sandstone bodies. In conclusion, under the present specifications set for a geothermal fairway, the Vicksburg has minimal potential because of low reservoir deliverability, which is constrained by low permeability and somewhat limited reservoir continuity. If future tests indicate that lower permeabilities are acceptable, the Vicksburg Fairway should be reconsidered because of the presence of extremely thick sandstone bodies.

522. GGIS-100242/R/ / /M/ / / / /

Title- Geothermal Resources, Wilcox Group, Texas Gulf Coast

Author(s)- / Bebout , D. G. / Gavenda , V. J. / Gregory , A. R. /

Publication date- January 1978

Pagination- 84 Pages

Report/patent- ORO--4891-3

Corporate Author- Texas University, Austin

Bureau of Economic Geology

Austin , Texas , USA

Descriptor(s)- / Electrical surveys / Geopressure resources /
Geopressured zones / Geothermal exploration / Geothermal
resources / Gulf Coast / Regional analysis / Sandstone /
Stratigraphic maps / Texas / Thickness / Wilcox Formation /

Abstract by TIC

Results are presented of a regional study to identify areas where the Wilcox Group contains significant thicknesses of sandstone with subsurface temperatures higher than 300 DEG F. Eight of these geothermal fairways were identified. Control for

this study was based on wells chosen so as to provide stratigraphic dip sections spaced 15 to 20 miles apart along the entire Texas Gulf Coast. Electrical well logs from the eight fairways are shown. (MHR)

523. GGIS-100241/O/ / /A/ / / / /

Title- Geothermal Sales Contracts

Author(s)- / Snyder , S. A. /

Conference- Geothermal Resources Development Institute Conference

Salt Lake City

Utah

USA (January 27 , 1977)

Publisher- Rocky Mountain Mineral Law Foundation

Boulder, CO

Publication date- January 27 , 1977

Pagination- 37 Pages

Report/patent- CONF-770135--

Descriptor(s)- / Contracts / Geothermal resources / Legal aspects /
Trade /

Abstract by TIC

The sixteen sections in the first geothermal steam sales contract between Magma Power Company and Thermal Power Company and Pacific Gas and Electric Company are listed and discussed briefly. The legal developments between contracts are mentioned. A checklist is given of matters that must be considered in negotiating a sales contract for geothermal energy: restrictions contained in seller's title, consideration of problems involving the lease term, the problem of "other minerals", produced with the geothermal fluids, water law, other lease clauses that must be considered in the negotiations of a sales contract, the royalty problem, conditions precedent to the effectiveness of a contract, rights committed to the contract, taxes, price and measurement, equipment for conversion of the geothermal energy to electricity, surface rights, effluent disposal, right to terminate, renegotiation on changed conditions, assignments, indemnities and insurance, settlement of disputes, applicable law, and confidentiality. (MHR)

524. GGIS-100240/J/ / /A/ / / / /

Title- Geothermal Sales Contracts

Author(s)- / Snyder , Sam A. /

Journal- Land Water Law Review

Publication date- Vol. 13 , Issue 1 , 1977

Pagination- Page 259 , 30 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Contracts / Geothermal resources / Legal aspects /
Trade /

Abstract by EIC

Things that a producer of geothermal energy should consider when selling the resource to another party for the purpose of

Geopressed Geothermal Bibliography

generating electricity are discussed. Reference for the sale of geothermal steam by the Union Oil Co. of California from its properties in the northern part of the state is to the original contract between the Magma Power Co. and the Pacific Gas and Electric Co. The checklist for consideration by attorneys includes 20 items.

525. GGIS-100534/J/ / /A/ / / / /

Title- Geothermal System Cuts Hospital's Energy Bills

Publisher- The Bureau of National Affairs

Washington, D.C.

Publication date- Vol. 10 , Issue 13 , April 1 , 1982

Pagination- Page 314 , 1 Pages

Local Availability- CES

Descriptor(s)- / Direct energy utilization / Geothermal heating /
Geothermal space heating / Texas / Thermal waters /

Abstract by GGIS

The operation of a geothermal heating system in Marlin,
Texas is announced.

526. GGIS-100343/J/ / /A/ / / / /

Title- Geothermal Systems and Their Energy Resources

Author(s)- / White , Donald E. / Guffanti , Marianne /

Journal- Rev. Geophys. Space Phys.

Publication date- Vol. 17 , Issue 4 , June 1979

Pagination- Page 887 , 16 Pages

Corporate Author- Geological Survey

Menlo Park , California , USA

Descriptor(s)- / Direct energy utilization / Electric power /
Exploration methods / Geopressed zones / Geothermometers /
Gulf Coast / Hydrothermal systems / Methane / Power generation /
Uses /

Abstract by Compendex

Outstanding advances in geothermal resource utilization include:
(1) rapid growth in electrical generation from hydrothermal
convection systems; (2) increasing interest in low-temperature
geothermal waters for non-electrical (direct) uses; and (3)
recognition of the resource potential of the geopressed
environment of the Gulf Coast for geothermal and methane energy.
Major advances in the understanding of geothermal systems have
resulted from several new developments. (1) A variety of
chemical and isotopic geothermometers and mixing models were
developed and are being widely used for predicting subsurface
temperatures of hydrothermal convection systems. (2) High $^3\text{He}/^4\text{He}$
ratios are now recognized as reliable indicators of mantle or
deep crustal contributions to the hydrosphere and atmosphere.
(3) Many geophysical techniques have been tested in exploration
of hydrothermal convection systems and delineation of reservoir
extent. (4) Teleseismic P-wave delays and attenuation of
seismic energy imply huge volumes of magma under Yellowstone
National Park (Wyoming), The Geysers--Clear Lake (California),
and Long Valley (California).

527. GGIS-100405/R/ / /M/ / / / /

Title- Geothermal Technology Publications and Related Reports:

(January 1977-December 1980)

Subtitle- A Bibliography

Author(s)- / Hudson , Sandra R. /

Publication date- April 1981

Pagination- 130 Pages

Report/patent- SAND81-0662

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC04-76DP00789 /

Corporate Author- Sandia Labs.

Albuquerque , NM , USA

Descriptor(s)- / Bibliographies / Drill bits / Drilling fluids /
Energy source development / Field studies / Geothermal drilling
/ Geothermal exploration / Heat extraction / High temperature /
Magma systems / Materials testing / Research programs / Well
completion / Well logging equipment /

Abstract by Author

This bibliography lists titles, authors, abstracts, and reference information for publications which have been published in the areas of Drilling Technology, Logging Instrumentation, and Magma Energy during the period 1977-1980. These publications are the results of work carried on at Sandia National Laboratories and their subcontractors for the U.S. Department of Energy, Divisions of Geothermal Energy, Basic Energy Sciences, and Fossil Fuel Extractions. Some work was also done in conjunction with the Morgantown, Bartlesville, and Pittsburgh Energy Technology Centers.

528. GGIS-100119/ / / /M/ / / / /

Title- Geothermal Utilization Technology for Gulf Coast Geopressure Resources

(7/74 to 6/75)

Author(s)- / Underhill , G. K. /

Publication date- 1975

Available- University of Texas, School of Engineering

Univ. of Texas

School of Engineering, Mechanical Engineering

200 W. 21St

Austin, Texas 78712

Corporate Author- Texas Univ.

Abstract by Energyline

At the present time U. S. interest in the development of geothermal generation of electricity is high even though total U. S. generation is only about 500 MW(E) from the big Geysers dry steam field in California. It has been estimated, however, that the geopressure geothermal resources located along the Gulf of Mexico Coast in Texas could play a very significant role

in electrical generation, process heat supply, and methane production. The resource, however, presents challenging technological and environmental problems if it is to be developed efficiently and acceptably. The main utilization problems are: 1) the efficient use of the low-enthalpy geothermal fluid with flash-steam or total flow direct cycles or with binary-fluid cycles interfaced to the geothermal fluid with heat exchangers, 2) the total or multiple-use integration of process heat exchangers, 3) the total or multiple-use integration of process heat industry with the geothermal resource, 4) the net energetics and economics aspect of resource utilization, and 5) the environmental considerations attendant with the large quantities of waste water exhausted from the utilization cycle or process. Investigations, designed to elucidate aspects of the preceding four problems, are proceeding.

529. GGIS-100155/J/ / /A/ / / / /

Title- Geothermal Well Completion

Author(s)- / Boyd , W.E. / Dorfman , W.H. /
Publication date- Vol. 39 , Issue 5 , March 1978

Pagination- Page 30 , 6 Pages

Auxiliary expression(s)-

Illus. / Figure (3) /
Table

Descriptor(s)- / Commercialization / Drilling equipment / Equipment /
Gulf Coast / Technology assessment / Well completion / Well
drilling /

Abstract by WRA

Geological assessment studies indicate that commercially attractive geothermal-geopressured resources exist in several areas of the Gulf Coast at depths of 12,000 to 20,000 feet. Drilling machinery, tools and equipment for deep wells have now been developed to the extent that they are considered quite satisfactory for the loads, pressures, and temperatures to be encountered in 20,000 feet geothermal wells. The wellhead assembly for a typical completion would be a 20 x 13 3/8 x 9 5/8 x 5 1/2 inch, 15,000 psi working pressure assembly. Casing would consist of three strings to the surface plus liner plus the 5 1/2 inch tubing. Cement bond logs should be run during completion procedures to locate any channels or gaps in the cement sheath. It is currently deemed preferable to perforate casing at a wellbore pressure somewhat less than formation pressure. Perforation should be started from the lowest producing interval and proceed upwards to enable successive runs at shallower depths. A perforated casing gravel-pack can be used to control sand should sand pumping problems arise.

530. GGIS-100995/ / / /A/ / / / /

Title- Geothermal Well Completion

Subtitle- State of the Art

Author(s)- / Snyder , Robert E. /

Publication date- Vol. 2 , Issue 2 , 1978
 Pagination- Page 601 , 3 Pages
 Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 California
 95616

Local Availability- CES

Auxiliary expression(s)-
 Illus. / Diagram (3) / Graph (1) /
 Ref.

Descriptor(s)- / Geopressured wells / Geopressured zones / Geothermal wells / Geysers geothermal field / Gulf Coast / Hot dry rock systems / Hot water systems / Imperial Valley / Louisiana / Texas / Valles Caldera geothermal field / Vapor dominated systems / Well completion /

Abstract by Author

Present methods for completing steam and liquid dominated, dry rock, and geopressured geothermal wells are described by interpretive review of actual and proposed operations in The Geysers, Imperial Valley, the Valles Caldera, New Mexico project, and Louisiana-Texas geopressured zones. Limitations of technology and equipment that has been adapted for the petroleum industry to meet new and unique requirements of these downhole environments are objectively analyzed.

 531. GGIS-100228/R/ / /M/ / / / /

Title- Geothermal Well Completions

Subtitle- An Overview of Existing Methods in Four Types of Developments

Author(s)- / Snyder , R. E. /

Publication date- January 1978

Pagination- 128 Pages

Report/patent- SAND--78--7010

Local Availability- CES

Sponsor- / US DOE
 EY-76-C-04-0789 /

Corporate Author- Completion Technology Co.
 Houston , Texas , USA

Auxiliary expression(s)-
 Illus. / Figure (35) /
 Table
 Ref.

Descriptor(s)- / Geopressured wells / Geothermal wells / Gulf Coast / Injection wells / Producing wells / Well completion /

Abstract by TIC

Existing practices and capabilities for completing producing and injection wells for geothermal application in each of four categories of geothermal environments are discussed. Included are steam wells in hard, fractured rocks (The Geysers, California), hot water wells in sedimentary formations (Imperial Valley, California), hot, dry impermeable rocks with circulating water systems (Valles Caldera, New Mexico), and geopressured, geothermal water wells with associated hydrocarbon production on the U.S. Gulf Coast.

Geopressured Geothermal Bibliography

532. GGIS-100308/O/ / /A/ / / / /

Title- Geothermal Wellheads--

Subtitle- The Heart of Geothermal Production Systems

Author(s)- / Godare , Bill /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 207 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Illus.. / Diagram (4) /

Descriptor(s)- / Geothermal wells / Producing wells / Surface
equipment / Well casings / Well completion / Wellheads /

Abstract by Author

The properly designed wellhead unit provides complete well control during the drilling, casing, cementing, well testing, and well production phases of a geothermal well's life. The geothermal wellhead unit must provide total well control, as does the oil, gas, and domestic water wellhead assemblies do, and it must accomplish and provide the total well control at elevated temperatures. Consequently, because of the elevated temperatures, the wellhead must be designed to absorb varying amounts of production casing thermal expansion, while maintaining adequate environmental protection and personnel safety.

533. GGIS-100267/B/ / /M/ / / / /

Title- Geothermal World Directory

Subtitle- 1977/78

Publisher- Geothermal World Publications

Reseda, California

Publication date- 1977

Pagination- 379 Pages

Available- Geothermal World Publications

18014 Sherman Way

Suite 169

Reseda

California

91335

(Cloth)

Local Availability- CES

Descriptor(s)- / Contracts / Directory / Geopressure resources /
Geothermal energy / Hot dry rock systems / Hot water systems /
Public utilities / US ERDA / Vapor dominated systems /

Abstract by TIC

The directory is made up of two parts. Part I consists of: table of contents; contacts and organization of USERDA's Division of Geothermal Energy; public utilities; power pools; business listing; international individual listings; individuals (U.S. and Canada); and universities and colleges. Part II is made up of articles, important news items, and general geothermal information.

534. GGIS-100557/R/ / /M/ / / / /

Title- Geothermal-Subsidence Research Program Plan Aid Review

Author(s)- / Goldstein, N.E. / Noble, J.E. / Simkin, T.L. /

Publication date- September 1980

Pagination- 49 Pages

Report/patent- LBL-11271

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Berkeley

Berkeley, USA

Descriptor(s)- / Geopressure resources / Ground subsidence / Gulf Coast / Recommendations / Research programs /

Abstract by GGIS

The revised Geothermal Subsidence Research Plan (GSRP) presented here is the result of two years of research based on the recommendations of a technical advisory committee and on the DOE/DGE's wish to include specific components applicable to the geopressure resources on the Gulf Coast. This revised plan describes events leading up to FY 1979 and 1980 and the resulting research activities completed for that period. At the time of this writing most of the projects are completed; this document summarizes the accomplishments of the GSRP during FY 1979 and 1980 and includes recommendations for the FY 1981 and 1982 programs.

535. GGIS-100028/J/ / 2808/A/ / / / /

Title- Geothermics

Author(s)- / Rinehart, John S. /

Journal- Appl. Mech. Rev.

Publication date- Vol. 28, Issue 8, August 1975

Pagination- Page 1081, 4 Pages

Descriptor(s)- / Geothermal energy / Vapor dominated systems / Hot water systems / Geopressed systems / Hot dry rock systems / Geothermal resource systems / Temperature gradients / Cost / United States / Power potential / New Zealand / Mexico /

Abstract by NTIS

This article describes the five general types of geothermal resources that can be used to generate electric power: dry

Geopressured Geothermal Bibliography

steam which streams from holes drilled to great depth (a steam-dominated system); wet steam which is generated when superheated water gushing from drilled holes partly flashes into steam (a water-dominated system); geopressurized reservoirs in which fresh water at high pressure is stored deep underground; hot water which flows from natural or man-made holes at a temperature less than its boiling point (a hot water system); and hot rocks, deeply buried, from which dry steam can be generated by dousing with water (a dry steam). The three main producing areas (Wairakei, The Geysers, and Lardarello) as well as a number of pilot plants are described.

536. GGIS-100061/J/ /13146/A/ // //

Title- Geothermy and the Geologists

Original Title- La Geothermie et les Geologues

Author(s)- / Sahores, J. /

Journal- Rev. Gen. Therm.

Publication date- Vol. 13, Issue 146, February 1974

Pagination- Page 115, 4 Pages

Language- French

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Dry-steam systems / Geology / Geophysics /
Geopressured systems / Geothermal energy / Geothermal
exploration / Geothermal resources / Hot dry rock systems / Hot
water systems / Legislation /

Abstract by NTIS

Experience gained in oil prospecting is useful in prospecting and working geothermal sites. In the search for geothermal energy the steam sites are distinct from the hot water ones (numerous deep deposits); amongst the latter, the hot water sites, at the hydrostatic pressure, are distinct from the hot water ones in geopressure condition. Very hot compact rocks could also release their energy through hydraulic fracturation. A knowledge of the importance of this energy should lead to the setting up of a national legislation concerning it and to the organization of a geothermal teaching discipline. 5 refs. In French.

537. GGIS-100023/J/ / 5704/A/ // //

Title- Global Look at High Pressures

(Abstract)

Author(s)- / Deju, Raul A. /

Publisher- American Association of Petroleum Geologists

Journal- American Association of Petroleum Geologist Bulletin

Publication date- Vol. 57, Issue 4, 1973

Pagination- Page 775, 1 Pages

Descriptor(s)- / Engineering geology / Geopressured reservoirs /
Petroleum / Gas / Geopressure / High pressure / Origin /
Mechanism / Global /

538. GGIS-100551/R/ / /M/ / / / /

Title- Godchaux Well No. 1, Vermilion Parish, Louisiana
(Final Report)

Subtitle- Completion and Testing

Publication date- 1981

Pagination- 91 Pages

Report/patent- DOE/ET/27081-7

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA).

AC08-80ET27081 /

Corporate Author- Eaton Operating Co., Inc.

Houston , TX , USA

Descriptor(s)- / Drilling / Failures / Godchaux Well No. 1 / Louisiana

/ Reentry / Vermilion Parish / Well drilling /

Abstract by NTIS

The Godchaux Well No. 1 was originally drilled to a total depth of 16,000 feet in January, 1981 by C & K Petroleum, Inc. and was temporarily abandoned. The well was re-entered by Eaton on 6 August 1981 in an effort to clean out the original open hole below the 7-5/8 inch liner and test a section of the Planulina sand at a depth ranging from 15,584 to 15,692 feet. The reservoir pressure was estimated to be 298 exp 0 F. The water salinity was predicted to be 70,000 ppm. The well was expected to produce up to 20,000 BWPD, with a gas content of 44 SCF per barrel. An optional test of a zone from 14,905 to 15,006 feet was also proposed in the detailed completion prognosis, which preceded the attempted test. In the process of drilling the cement plug set by the original operators, the drill string became side-tracked from the original hole. While drilling at 14,510 feet a severe loss of circulation caused the open hole to close around and stick the drill string. Efforts to repair the intermediate casing and return to normal operations were estimated to be prohibitively expensive in view of the expected poor probability of success; accordingly, the decision to plug and abandon was carried out on September 12, 1981.

539. GGIS-100236/J/ / /A/ / / / /

Title- Governing Equations for Geothermal Reservoirs

Author(s)- / Brownell , D. H. /

Journal- Water Resour. Res.

Publication date- Vol. 13 , Issue 6 , December 1977

Pagination- Page 929 , 6 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Equations / Fluid flow / Geothermal reservoirs / Hydrothermal systems / Mathematical models / Rock matrix /

Two-phase flow /

Abstract by EIC

Governing equations--specifically balance laws and constitutive relations--are developed for hydrothermal geothermal reservoirs. Topics include: balance Laws single phase (liquid water); balance equations for passive reservoir;

Geopressured Geothermal Bibliography

nondimensional analysis; extension to two-phase (liquid-vapor) flow; and constitutive relations for the rock matrix.

540. GGIS-100528/O/ / /A/ / / / /

Title- Government, Gas, and Gambler's Ruin

Author(s)- / Frederick , D.O. / Roberts , K.D. / Striker , B.N. / Vanston , J.H. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 111 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-79ET27112 /

Auxiliary expression(s)-

Table

Descriptor(s)- / Commercialization / Economics / Energy source development / Financial incentives / Resource development / Risk assessment / Simulation /

Abstract by Author

This paper summarizes the results of a group of Monte Carlo simulations performed during the spring and summer of 1980 to investigate the economic potentials for various types of parties which might elect to develop a geopressured-geothermal resource similar to that found in Brazoria County, Texas; the ability of government to stimulate development through different economic incentives was also explored. This research does not lead to optimism concerning private sector development of the resource. High, but not wholly improbable, methane prices or the emergence of a geopressured-geothermal heat market would make development significantly more likely. Corporate independents bear significantly greater risks in development than do large corporations or certain limited partnerships.

541. GGIS-100066/J/ /18206/A/ / / / /

Title- Graphical Method Predicts Geopressures Worldwide

Author(s)- / Eaton , Ben A. /

Journal- World Oil

Publication date- Vol. 182 , Issue 6 , May 1976

Pagination- Page 51 , 6 Pages

Descriptor(s)- / Oil well drilling / Oil wells / Bottom hole pressure / Well logging /

Abstract by ERDA/RECON

Past methods for calculating and locating abnormally pressured formations usually were applicable only in areas for which they were derived, but a new technique described here should be useful throughout the world. Equations are derived empirically and take into account variations in overburden pressure between geographical locations. The use of equations to develop a graphical method of determining geopressure magnitudes from well log or seismic data is described.

542. GGIS-100066/J/ /18206/A/ / / / /

Title- Graphical Method Predicts Geopressures Worldwide

Author(s)- / Eaton , Ben A. /

Journal- World Oil

Publication date- Vol. 182 , Issue 6 , May 1976

Pagination- Page 100 , 5 Pages

Auxiliary expression(s)-
Ref.

Descriptor(s)- / Exploration / Oil well drilling / Well logging /
Graphic methods / Calculation methods / Data analysis /
Geopressure / Overburden /

Abstract by NTIS

In 1972, a theory explaining the effect of overburden stress gradients on geopressure prediction techniques was presented. Since that time, enough actual well data have been published to enable formulation of equations that can be used to reliably calculate geopressure magnitudes from basic log parameters in all parts of the world. This article introduces these new equations, presents graphical solutions to the equations, and illustrates their use with several actual well situations. 8 refs.

543. GGIS-100995/ / / /A/ / / / /

Title- Ground Water Monitoring Methodology for Geothermal Development

Author(s)- / Weiss , Richard /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 709 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Illus. / Figure (1) /

Ref.

Descriptor(s)- / Aquifers / Geothermal reservoirs / Ground water /
Injection wells / Waste injection / Water monitoring / Water
pollution /

Abstract by Author

The proposed ground water monitoring methodology for geothermal development specifies a seven-step monitoring system development and evaluation procedure consisting of (1) definition of baseline conditions and projected development; (2) forecast of aquifer conditions; (3) definition of necessary detection limits; (4) evaluation of alternative ground water and disposal facility monitoring techniques; (5) proposal of monitoring system and alternatives; (6) implementation of monitoring system; and (7) continuation of monitoring program and modification as necessary.

544. GGIS-100473/R/ / /M/ / / / /

Title- Guidelines to the Preparation of Environmental Reports for Geothermal Development Projects

Publication date- February 1977

Pagination- 70 Pages

Report/patent- ERHQ-0001

Local Availability- GGIS

Corporate Author- Energy Research and Development Administration

Div. of Geothermal Energy

Washington, D.C. , USA

Auxiliary expression(s)-

Table

Descriptor(s)- / Compliance / Geothermal exploration / Geothermal resources / Geothermal systems / Legal aspects / Legislation / Recommendations / Regulations / US ERDA /

Abstract by Author (revised)

Guidelines to the preparation of environmental reports for geothermal development projects are contained in this document. The major portion of this report contains extensive instructions concerning the scope of an environmental report. Briefly, the chapters that comprise an environmental report are: introduction; description of the proposed activity; description of the existing environment; environmental effects of the proposed activity; effluent and environmental measurement and monitoring programs; reclamation and restoration; alternatives to the proposed action; irreversible and irretrievable commitments of resources; trade-off analysis; and compliance and regulations.

545. GGIS-100281/R/ / /M/ / / / /

Title- Guidelines Manual for Surface Monitoring of Geothermal Areas

Author(s)- / Van Til , C.J. /

Publication date- May 1979

Pagination- 128 Pages

Report/patent- LBL-8617

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Berkeley Lab.

Berkeley , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (15) / Photo (1) / Graph (5) / Map (13) /

Table

Ref.

Descriptor(s)- / Data analysis / Design / Fluid withdrawal / Geopressured systems / Geothermal fields / Ground subsidence /

Information / Measuring instruments / Measuring methods /
 Operation / Statistical models / Surface monitoring /
 Abstract by Author

In order to deal with the problem of geothermal subsidence, one must also consider subsidence resulting from other causes, because of both the necessity of distinguishing among different causes and the scarcity of data on geothermal subsidence. Various subsidence processes are discussed; these include groundwater withdrawal, oil and gas withdrawal, tectonism, collapsing soils (hydrocompaction), soil oxidation, underground mining, and slope creep. Subsidence in an area may result from two or more processes simultaneously; thus geopressured fields may be subject to subsidence from oil and gas withdrawal as well as from water withdrawal. The primary cause of subsidence in geothermal areas is loss of pore space due to fluid withdrawal. Because of the damage that subsidence can cause, it is important to establish programs of subsidence monitoring for all geothermal fields. Guidelines for the establishment of such a program are presented. Included are the preliminary investigation, the design of the system, the operation of the system, and data handling and analysis. Instrumentation is discussed and formats for data presentation are described. Procedures for statistical analysis of data are presented.

 546. GGIS-100374/O/ / /A/ / / / /

Title- Gulf Coast Geopressured Geothermal Energy:

(4. Session: Utility Projects and Plans.)

Subtitle- Summary of Research at the University of Texas at Austin

Author(s)- / Lamb, J. Parker /

Conference- 3rd Annual Geothermal Conference and Workshop Proceedings

Monterrey

California

USA (June 26 , 1979)

Publisher- Electric Power Research Institute

Palo Alto, California

Publication date- October 1979

Pagination- Page 38 , 4 Pages

Report/patent- EPRI-WS-79-166

Local Availability- CES

Auxiliary expression(s)-

Illus. / Figure (1) /

Descriptor(s)- / Diagenesis / Environmental effects / Geology /
 Geopressure resources / Institutional aspects / Legal aspects /
 Meetings / Methane / Research programs / Reservoir engineering /
 Resource assessment / Rock properties / Sandstone / Texas / Uses
 /

Abstract by Author (rev.)

A comprehensive investigation of Gulf coast geopressured-geothermal energy resources has been in progress at The University of Texas at Austin since 1974. In this review, each of the following areas of investigation will be described briefly: geological assessment, entrained methane, environmental impacts, sandstone diagenesis, elastic rock properties, resource engineering, resource utilization, legal

Geopressured Geothermal Bibliography

and institutional studies, operations research, and
geopressured-geothermal conferences.

547. GGIS-100995/ / / /A/ / / / /

Title- GELCOM:

Subtitle- A Geothermal Electric Levelized Cost Model

Author(s)- / Leigh, J.G. / Gupta, J.N. /

Publication date- Vol. 2, Issue 2, 1978

Pagination- Page 399, 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Sponsor- / U.S. Energy Research and Development Administration

EG-77-C-01-4014 /

Corporate Author- Mitre Corp.

METREK Div.

McLean, Virginia, USA

Auxiliary expression(s)-

Illus. / Figure (4) /

Descriptor(s)- / Computer codes / Cost / Economics / Electric power /
Geothermal power plants / Hot water systems / Models / Power
generation /

Abstract by Author

The model described in this paper is designed to project the costs of electricity generated from liquid-dominated hydrothermal geothermal resources. It exists in the form of an interactive computer program called GELCOM, written in FORTRAN IV. This paper provides an analytic explanation of the methodology.

548. GGIS-100431/R/ / /M/ / / / /

Title- GEOCITY

Subtitle- A Computer Code for Calculating Costs of District Heating
Using Geothermal Resources

Author(s)- / McDonald, C. L. / Bloomster, C. H. / Schulte, S. C.

Publication date- February 1977

Pagination- 70 Pages

Report/patent- BNWL-2208

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Energy Research and Development Administration,
Washington, D.C. (USA)

EY-76-C-06-1830 /

Corporate Author- Battelle Pacific Northwest Labs.

Richland, WA, USA

Auxiliary expression(s)-

Illus. / Diagram (9) /

Table

Ref.

Descriptor(s)- / Computer codes / Computerized simulation / Cost /
Direct energy utilization / District heating / Economics /
Geothermal heating / Hot water heating /

Abstract by Author (rev.)

GEOCITY is a computer simulation model developed to study the economics of district heating using geothermal energy. GEOCITY calculates the cost of district heating based on climate, population, resource characteristics, and financing conditions. The principal input variables are minimum temperature, heating day, population size and density, resource temperature and distance from load center, and the interest rate. From this input data the model designs the transmission and district heating systems. From this design, GEOCITY calculates the capital and operating costs for the entire system, including the production and disposal of the geothermal water. GEOCITY consists of two major submodels: the geothermal reservoir model and the distribution system model. The distribution system model calculates the cost of heat by simulating the design and the operation of the district heating system. The reservoir model calculates the cost of energy by simulating the discovery, development and operation of a geothermal resource and the transmission of this energy to a distribution center. The submodels can be used independently; that is, the distribution model will accept any source of hot water and the reservoir model will deliver energy to meet any demand. The distribution system model can simulate many designs for hot water heating systems. These alternative designs include various configurations of heat pumps and/or heat exchangers; different piping system design practices; and the use of different materials for pipe, insulation, and casing. GEOCITY can simulate nearly any financial and tax structure through varying the rates of return on equity and debt, the debt-equity ratios, and tax rates. Both private enterprise and municipal utility systems can be simulated. The reservoir model and the distribution model may have the same or differing financial structures and costs of capital. The distribution system and reservoir life can be varied over a long period, currently up to 50 years.

549. GGIS-100088/R/ / /M/ // //

Title- GEOCOST

Subtitle- A Computer Program for Geothermal Cost Analysis

Author(s)- / Bloomster , C. H. / Cohn , P. D. / De Steese , J. G. /
Huber , H. D. / La Mori , P. N. /

Publication date- February 1975

Pagination- 54 Pages

Report/patent- BNWL-1888

Local Availability- CES

Corporate Author- Battelle-Pacific Northwest Labs
Washington , USA

Descriptor(s)- / Economics / Geothermal energy / Mathematical models
/ Unconventional energy / Geothermal power plants / Geothermal

Geopressured Geothermal Bibliography

wells / Geothermal drilling / Geothermal exploration /
Production costs / Power plant design / Power plant construction
/ Power plant operation / Cost / Hydrothermal reservoirs / Geo
brine /

Abstract by Energyline

The GEOCOST computer program, a simulation model that calculates the cost of generating electricity from geothermal energy, is described. GEOCOST can simulate the production of electricity from most types of geothermal resources. It is composed of two principal parts: a reservoir model that simulates the exploration, development, and operation of a geothermal reservoir; and a power plant model that simulates the design, construction, and operation of the power plant. Five different types of power plants can be simulated: flashed steam, binary fluid cycle, a hybrid combined flashed steam-binary fluid cycle, total flow, and geopressured reservoirs.

550. GGIS-100253/R/ / /M/ / / / /

Title- GEOTHERM User Guide

Author(s)- / Swanson , J. R. /

Publisher- Geological Survey
Washington, D. C.

Publication date- 1977

Pagination- 43 Pages

Report/patent- USGS-OFR--77-504

Note- Portions of the document are illegible.

Corporate Author- Geological Survey
Reston , Virginia , USA

Descriptor(s)- / Chemical analysis / Data / Geothermal fields /
Geothermal resources / Geothermal wells / Information retrieval
/ Information systems / Manuals /

Abstract by TIC

GEOTHERM is a computerized geothermal resources file that contains data on geothermal fields, wells, and chemical analyses from the United States and international sources. The general information processing system (GIPSY) on the IBM 370/155 computer is used to store and retrieve data. The GIPSY retrieval program contains simple commands which can be used to search the file, select a narrowly defined subset, sort the records, and output the data in a variety of forms. Eight commands are listed and explained so that the GEOTHERM file can be accessed directly by geologists. No programming experience is necessary to retrieve data from the file.

551. GGIS-100407/O/ / /A/ / / / /

Title- GRITS

Subtitle- A Computer Model for Economic Evaluations of Direct Uses
of Geothermal Energy

Author(s)- / Toth , William J. / Barron , William F. / Kane , Sally /
Nilo , Bruce /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
 Salt Lake City
 Utah
 USA (September 9 , 1980)
 Publisher- Geothermal Resources Council
 Davis, CA
 Publication date- Vol. 4 , 1980
 Pagination- Page 747 , 4 Pages
 Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasei W. Roberts
 Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 CA
 95616
 Local Availability- GGIS
 Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy /
 Auxiliary expression(s)-
 Illus. / Graph (5) /
 Table
 Ref.
 Descriptor(s)- / Computer calculations / Computer codes /
 Computerized simulation / Cost / Direct energy utilization /
 District heating / Geothermal energy / Geothermal resources /
 Income / Mathematical models / Models / Programming /
 Sedimentary basins / Simulation /
 Abstract by GGIS

The GRITS interactive computer model can calculate the annual costs and revenues for the life span of low to moderate temperature direct use geothermal resources. Because this model can handle many variables, it is very flexible. Another advantage of using this model is the ability to express input parameters as time dependent functions so that changes in resource characteristics and demand conditions may be reflected for the duration of the project. In addition to describing the basic workings of the model, sensitivity analysis that can be performed is discussed.

 552. GGIS-100057/J/ / 1401/A/ // //

Title- Harnessing the Fires Below
 Author(s)- / Alexander , George /
 Journal- Natl. Wildlife
 Publication date- Vol. 14 , Issue 1 , December 23 , 1975
 Pagination- Page 36 , 4 Pages
 Corporate Author- Los Angeles Times
 Auxiliary expression(s)-
 Illus. / Drawing (1) / Map (1) / Photo (1) /
 Descriptor(s)- / Geothermal resources / Greenhouses / Geysers /
 Geothermal energy / Hot dry rock systems / Geo brine /
 Abstract by Energyline

Dry steam geothermal fields that are ideal for electricity production are few. The more common low grade water and steam systems have various other uses, such as home heating and

Geopressured Geothermal Bibliography

cooling, food production, and animal husbandry. Worldwide examples of multiple uses of geothermal power are cited. Hot dry rocks and geopressurized zones, two other types of geothermal fields, also have potential for heat retrieval. Difficulties with using geothermal power are outlined. (1 drawing, 1 map, 1 photo)

553. GGIS-100999/0/ / /A/ / / / /

Title- Heat Exchanger Design for Geothermal Power Plants

Author(s)- / Dambly , Benjamin W. /

Conference- 13th Intersociety Energy Conversion Engineering Conference

Pagination- Page 1102 , 7 Pages

Report/patent- SAE--789311

Auxiliary expression(s)-

Illus. / Diagram (9) / Graph (2) / Photo. (1) /

Ref.

Descriptor(s)- / Design / Geothermal brines / Geothermal power plants / Heat exchangers / Rankine cycle power systems / Transfer pipes / Working fluids /

Abstract by Author

This paper describes the development of a unique and proprietary method of shell-and-tube heat exchanger construction. Designed specifically for use in a pilot hydrothermal geothermal power plant the units described here will utilize isobutane in an organic Rankine cycle power process. This design provides true counterflow configuration by eliminating the conventional crossbaffles normally associated with such equipment. Spacing and support are provided by deformed short tubes shaped to fit within each cluster of seven tubes. These spacers are held in place by the clamping action of a strap around each cluster. The exchanger tube bundle is made up of an integration of such support clusters both along its length, and laterally across the tube bank. By providing an optimum ratio of surface area-to-pressure drop, efficiency of heat exchange is effectively increased and pumping power is significantly reduced.

554. GGIS-100411/0/ / 1/A/ / / / /

Title- Heat Exchanger Performance with Low-Salinity Geothermal Brines

Author(s)- / Hinrichs , Tom /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 263 , 4 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Descriptor(s)- / Binary fluid systems / Brines / Geopressured systems / Heat exchangers / Performance / Salinity / Scaling / Temperature effects / Testing /

Abstract by ERDA/RECON

Portable, small-scale heat exchanger testing units were used to evaluate heat exchanger performance for low-salinity brines in the Imperial Valley Field. One unit involves four shell-and-tube heat exchangers operating in series. Another involves one tube and four shell-and-tube heat exchangers in series. In addition to the overall heat exchanger performance, the effects of brine temperature were also studied. It is suggested that a test device should be used to supplement any well testing heat exchanger performance for these reservoirs. (LS)

555. GGIS-100050/J/ / 8017/A/ / / / /

Title- Heat Flow and Gravity Interpretation Across the Rio Grande Rift in Southern New Mexico and West Texas

Author(s)- / Decker, E. R. / Smithson, S. B. /

Journal- Journal of Geophysical Research

Publication date- Vol. 80, Issue 17, 1975

Pagination- Page 2542, 11 Pages

Descriptor(s)- / New Mexico / Texas / Rio Grande Rift / Heat flow / Gravity surveys / Radiogenic heat sources / Tectonics / Structural geology / Geological setting / Subsurface temperatures / Drilling / Maps / Tables / Diagrams / Geothermal gradients / Lithology /

556. GGIS-100004/O/ / /A/ / / / /

Title- Heat Generation in Lithification of Oil-Forming Clay Strata

Author(s)- / Schvetsov, Peter F. /

Conference- Development and Utilization of Geothermal Resources

Publication date- Vol. 1, May 29, 1975

Pagination- Page 609, 4 Pages

Available- Superintendent of Documents

U.S. Government Printing Office

Washington, D.C.

20402

USA

Local Availability- CES

Auxiliary expression(s)-

Ref.

Descriptor(s)- / USSR / Tectonophysics / Heat flow / Tersko-Kumsk Basin / Kanty-Maorsijsk Basin / Sedimentary rocks / Diagenesis / Processes / Consolidation / Catagenesis / Origin / Pore water / Clay minerals /

557. GGIS-100995/ / / /A/ / / / /

Title- Heat Transfer Consideration in Utilizing Geothermal Energy

Geopressured Geothermal Bibliography

Author(s)- / Michel , John W. /
Publication date- Vol. 2 , Issue 2 , 1978
Pagination- Page 441 , 4 Pages
Available- Geothermal Resources Council

P.O. Box 98
Davis
California
95616

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (2) / Photo (1) /
Table
Ref.

Descriptor(s)- / Ammonia / Binary cycle power generation / Elevated temperature / Geopressure resources / Geothermal energy / Heat exchangers / Heat transfer / Moderate temperature / Pipes / Power generation / Waste heat / Working fluids / 2-methylpropone /

Abstract by Author

Although some forms of geothermal energy will require the application of high temperature technology, most involve only low temperatures. This paper emphasizes the importance of efficient, low cost heat exchangers in the use of low temperature sources and in the waste heat rejection systems of power generation cycles. Results of recent heat transfer development work at ORNL show that for the working fluids which are attractive for use in these cycles the condensation heat transfer effectiveness can be improved by a factor of from 3 to 7 by the use of fluted tubes and condensate drain-off skirts. Data are presented for condensation of six fluorocarbons, isobutane, and ammonia on a variety of tube surfaces. These results are being applied to the design of a 40-tube heat exchanger to be tested in a geothermal energy test facility.

558. GGIS-100532/O/ / /A/ / / / /

Title- Helical Rotary Screw Expander Power System

Author(s)- / McKay , Richard A. / Sprankle , Roger S. /

Conference- Conference on Research for the Development of Geothermal Energy Resources
Pasadena

CA (September 23 , 1974)

Publication date- December 31 , 1974

Pagination- Page 301 , 8 Pages

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (1) /
Ref.

Descriptor(s)- / Brines / Corrosion / Geothermal brines / Geothermal industry / Geothermal power plants / Geothermal resources / Technology assessment / Technology utilization /

Abstract by GGIS

The helical rotary screw expander power system for use in wet steam geothermal fields is described. Corrosion, mineral deposition, the expansion process, experience with a prototype helical screw expander, and a proposed evaluation project are discussed.

559. GGIS-100583/R/ / /M/ / / / /

Title- Help for Declining Natural Gas Production Seen in the Unconventional Sources of Natural Gas

(GAO Report)

Publication date- January 10 , 1980

Report/patent- EMO-80-8

Auxiliary expression(s)-
Table

Descriptor(s)- / Gas production / Geopressured zones / Methane /
Natural gas /

560. GGIS-100344/R/ / /M/ / / / /

Title- Help for Declining Natural Gas Production Seen in the Unconventional Sources of Natural Gas

Publication date- January 1980

Pagination- 47 Pages

Report/patent- PB 80-128929

Available- NTIS

(Paper Copy)

(Microfiche)

Corporate Author- General Accounting Office

General Accounting Office, Energy and Minerals Div.

Washington , D.C. , USA

Descriptor(s)- / Financial incentives / Gas production / Geopressured
zones / Government policies / Natural gas / Technology
assessment / Energy supplies / Geopressured systems / Energy
policy / Deregulation /

Abstract by TIC

Oil imports could be reduced and domestic gas production increased if additional gas production is obtained from four unconventional resources--eastern Devonian shales, tight sands, coal beds, and geopressured zones. This report discusses these four unconventional sources of natural gas and the prospects that gas from these resources can help supply the country with needed fuel. The report notes that gas produced from the unconventional gas sources could help to maintain overall gas production levels. Observations are included on technical progress required to increase gas recovery and Federal incentives for encouraging the use of these resources.

561. GGIS-100023/J/ / 5705/A/ / / / /

Title- High Fluid Potential in California Coast Ranges and Their Tectonic Significance

(Mudstones with Low Fluid Transmissibilities, Fracture Flow
Igneous Chemistry, Relation to Folds, Genesis of Folds and
Faults Regionally Interpreted)

Author(s)- / Berry , Fredrick A. F. /

Publisher- American Association of Petroleum Geologists

Journal- American Association of Petroleum Geologist Bulletin

Geopressured Geothermal Bibliography

Publication date- Vol. 57 , Issue 5 , 1973

Pagination- Page 1219 , 31 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Tectonics / Cenozoic Era / Fractures / Faults / Structural geology / Structure / United States / Systems / Coast ranges / Folds / Interpretation / Geopressure / Subsidence / Deformation / Mudstone / Relation / Ground water / Oil and gas fields / Effects /

562. GGIS-100024/B/ / 11/A/ / / / /

Title- High Fluid Potentials in California Coast Ranges and Their Tectonic Significance

(Paper 14 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)

Author(s)- / Berry , Frederick A. F. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 11 , 1974

Pagination- Page 175 , 31 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / California / Tectonics / Structural geology / Structure / Coast ranges / North / San Joaquin Valley / Kettleman Hills / Lost Hills / Coalinga / Great Valley / Folds / Faults / Fractures / Hydrodynamics / Fluid properties / Geopressure / Oil and gas fields / Porosity / Geochemistry / Origin / United States /

563. GGIS-100528/O/ / /A/ / / / /

Title- High Pressure Solvent Extraction of Methane from Geopressure Fluids

Author(s)- / Quong , R. / Otsuki , H.H. / Locke , F.E. / Netherton , R. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 121 , 5 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (2) /

Table

Ref.

Descriptor(s)- / Brines / Economics / Experimental results / Geothermal fluids / Injection / Methane / Power generation / Solvents / Specifications /

Abstract by Author

Solvent extraction is proposed as a means of recovering dissolved methane from geopressured-geothermal brines at high pressures. Our assessment shows that additional investment in a high pressure solvent extraction plant preceding direct injection disposal of brines into isolated aquifers can be

profitable. The technical and economic issues are discussed and compared with other injection methods such as complete depressurization for methane recovery followed by conventional mechanical pumping. The contributions of hydraulic (pressure) energy recovery and geothermal power production are also assessed. As a first step in the evaluation of solvent extraction, the solubilities of a promising solvent candidate, n-hexadecane, and a potential low cost solvent, No. 2 Diesel fuel, were measured in 15 wt% NaCl solutions at temperatures up to 150 deg C. Preliminary results of initial extraction tests at 150 deg C and 1000 psi in sub-pilot scale equipment are also presented.

564. GGIS-100066/J/ / /A/ / / / /

Title- High Pressure Well Completions

Subtitle- 8. Part--New tool that improves packer bore receptacle completions and methods for selecting downhole seal materials are discussed

Author(s)- / Snyder , Robert E. / Suman , George O., Jr. /

Publication date- Vol. 187 , Issue 2 , August 1 , 1978

Pagination- Page 73 , 6 Pages

Corporate Author- Completion Technology Co.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (6) /

Table

Ref.

Descriptor(s)- / Control / Drilling equipment / Elastomers /
Geopressured wells / Materials testing / Performance testing /
Seals / Well completion /

Abstract by Author

Physical and performance properties of material used in downhole sealing elements are presented to aid in their selection. Also discussed is a new completion tool that may be used in conjunction with a packer bore receptacle to allow for smaller diameter, less expensive tubing in high pressure wells.

565. GGIS-100066/J/ / /A/ / / / /

Title- High Pressure Well Completions

Subtitle- 6. Part--What to consider when planning stimulation and sand control jobs

Author(s)- / Snyder , Robert E. / Suman , George O., Jr. /

Publication date- Vol. 187 , Issue 2 , August 1 , 1978

Pagination- Page 113 , 9 Pages

Corporate Author- Completion Technology Co.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (12) /

Table

Ref.

Descriptor(s)- / Acidization / Bottom hole pressure / Fracturing /
Geopressured wells / Sand control / Well stimulation /

Geopressured Geothermal Bibliography

Abstract by Compendex

Unique downhole factors related to deep wells, especially those penetrating geopressured sections, require carefully planned and engineered stimulation treatments. Part 6 of this article discusses these special conditions and how they may be contemplated. Such control for high pressure wells is discussed briefly.

566. GGIS-100066/J/ / /A/ / / / /

Title- High Pressure Well Completions

Subtitle- I. Part--Origin of Abnormal or High Pressure, Detection Techniques and Fracture Gradient Calculations are Discussed

Author(s)- / Snyder, Robert E. / Suman, George O. /

Publication date- Vol. 187, Issue 2, August 1, 1978

Pagination- Page 35, 10 Pages

Corporate Author- Completion Technology Co.

Houston, Texas, USA

Auxiliary expression(s)-

Illus. / Figure (13) /

Table

Ref.

Descriptor(s)- / FFG / Geopressure exploration / Geopressured wells / Well casings / Well completion / Well drilling /

Abstract by Compendex

Part 1 of this article discusses the application of basic geopressure concepts in drilling and completion planning, including; definitions, origin of geopressures; how to detect, determine and/or predict geopressures; and fracture gradient prediction. Hints for designing casing programs using fracture gradients are described.

567. GGIS-100066/J/ / /A/ / / / /

Title- High Pressure Well Completions

Subtitle- 2 Part--Improved Logging, Coring and Testing Methods for Extreme Downhole Environments, plus New Wellhead Equipment Developments help make better wells

Author(s)- / Snyder, Robert E. / Suman, George O. /

Publication date- Vol. 187, Issue 2, August 1, 1978

Pagination- Page 47, 10 Pages

Corporate Author- Completion Technology Co.

Houston, Texas, USA

Auxiliary expression(s)-

Illus. / Figure (11) /

Table

Ref.

Descriptor(s)- / Bottom hole pressure / Bottom hole temperature / Downhole sampling / Drilling equipment / Drilling fluids / Drill stem testing / Elevated temperature / Geopressured zones / High pressure / Well casings / Well completion / Wellheads / Well logging /

Abstract by Author

Obtaining accurate formation data, critical to successful drilling and completion in hostile areas, depends highly on equipment capabilities and safety considerations. Latest state-of-the-art techniques are described. Also, important concepts of high pressure wellhead selection are included.

568. GGIS-100066/J/ / /A/ / / / /

Title- High Pressure Well Completions

Subtitle- 3. Part--Special H₂S resistant alloys plus methods of controlling stress cracking in standard downhole tubulars are described

Author(s)- / Snyder , Robert E. / Suman , George O., Jr. /

Publication date- Vol. 187 , Issue 2 , August 1 , 1978

Pagination- Page 123 , 8 Pages

Corporate Author- Completion Technology Co.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Graph (3) / Diagram (2) /

Table

Ref.

Descriptor(s)- / Corrosion resistance / Drill pipes / Drilling equipment / Geopressured wells / Hydrogen sulfides / Pore pressure / Steels / Stress corrosion / Well casings / Well completion /

Abstract by Author

Exploration and development drilling depths continue to increase, resulting in a higher probability of encountering sour gas that can produce sulfide stress cracking. Causes of the problem and methods for controlling it are discussed. Also included are recommendations for designing casing to meet down-hole-loading conditions in an H₂S environment.

569. GGIS-100066/J/ / /A/ / / / /

Title- High Pressure Well Completions

Subtitle- 4. Part--Considerations for designing completion and packer fluids and cements for higher temperature, applications are given

Author(s)- / Snyder , Robert E. / Suman , George O. /

Publication date- Vol. 187 , Issue 2 , August 1 , 1978

Pagination- Page 77 , 8 Pages

Corporate Author- Completion Technology Co.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (8) /

Table

Ref.

Descriptor(s)- / Density / Elevated temperature / Geopressured wells / Well cementing / Well completion / Working fluids /

Abstract by Author

Recommendations for formulating non-damaging, high density completion fluids plus uses of packer fluids are discussed.

Geopressured Geothermal Bibliography

Effects of varying circulating temperatures and low pipe to wellbore clearances on cementing operations are also described.

570. GGIS-100066/J/ / /A/ / / / /

Title- High Pressure Well Completions

Subtitle- 5. Part--Perforating.

Author(s)- / Snyder , Robert E. / Suman , George O., Jr. /

Publication date- Vol. 187 , Issue 2 , August 1 , 1978

Pagination- Page 57 , 8 Pages

Corporate Author- Completion Technology Co.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (11) /

Table

Ref.

Descriptor(s)- / Density / Drilling equipment / Drilling fluids /
Geopressured wells / Permeability / Productivity / Well
completion / Compaction /

Abstract by Author

Perforating high pressure, deep well can present some unique problems. This article is a discussion of basic factors that should be considered to obtain best perforating performance--and productivity--in such completions.

571. GGIS-100995/ / / /A/ / / / /

Title- High Temperature Instrumentation for Geothermal Applications

Author(s)- / Veneruso , A.F. / Stoller , H.M. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 679 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Sponsor- / U.S. Department of Energy

AT(29-1)-789 /

Corporate Author- Sandia Labs.

Albuquerque , New Mexico , USA

Auxiliary expression(s)-

Illus. / Graph (3) /

Table

Ref.

Descriptor(s)- / Boreholes / Elevated temperatures / Geothermal wells
/ Measuring instruments / Research programs / Well logging /

Abstract by Author

Instrumentation for making the geothermal borehole measurements is limited by the temperature capabilities (180 DEG C) of existing logging equipment developed for the oil and gas industry. The Geothermal Logging Instrumentation Development Program being conducted by Sandia Laboratories for the Department of Energy, Division of Geothermal Energy is an

industry based effort to develop and apply the high temperature instrumentation needed to make geothermal borehole measurements. The near-term goal is to develop instrumentation for use at 275 DEG C in pressures up to 48.3 MPa (7,000 PSI); subsequent goals are to extend the capabilities to 350 DEG C and 138MPa (20,000 PSI). Working closely with geothermal producers, logging service companies are conducting R&D to correct technical deficiencies so they may adequately serve the growing geothermal market. The basic impediments they face involve special technologies which are not normally required in their trade and for which there are insufficient incentives for them to develop. These technologies are precisely those which are being developed by this program; components development activities are directed toward stimulating industries' own inventions and field applications of geothermal logging instruments having improved reliability, appropriate size, reasonable cost and performance versatility which encompasses not only geothermal but conventional petroleum and hot, deep natural gas logging as well. Tools to be upgraded and/or developed include temperature, flow rate, high resolution downhole pressure, caliper and fracture mapping sondes.

572. GGIS-100569/R/ / /M/ / / / /

Title- High-Pressure Solvent Extraction of Methane from Geopressured Brines

Subtitle- Technical Evaluation and Cost Analysis

Author(s)- / Quong , R. / Otsuki , H.H. / Locke , F.E. /

Publication date- July 1981

Pagination- 29 Pages

Report/patent- UCID-19090

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Livermore Lab.

Livermore , USA

Descriptor(s)- / Brines / Cost / Cost benefit analysis / Evaluation / Feasibility studies / Methane / Solvents / Technology assessment /

Abstract by NTIS

Solvent extraction is proposed as a means of recovering dissolved methane from geopressured geothermal brines at high pressures. The assessment shows that additional investment in a high pressure solvent extraction plant preceding direct injection disposal of brines into isolated aquifers can be profitable. The technical and economic issues are discussed, and compared with other injection methods such as complete depressurization for methane recovery followed by conventional mechanical pumping. The contributions of hydraulic (pressure) energy recovery and geothermal power production are also assessed. For deep injection into the producing formation, it is concluded that methane extraction processes are not applicable, insofar as maintenance of high surface pressures provides no clear-cut energy benefits. As a first step in the evaluation of solvent extraction, the solubility of a promising solvent

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candidate, n-hexadecane, was measured in 15 wt % NaCl solutions at temperatures up to 150 exp 0 C. The solubility of a potential low cost solvent, No. 2 Diesel fuel, was also measured.

573. GGIS-100131/R/ / /M/ / / / /

Title- Hot Dry Rock Geothermal Energy

(Report No. 1 of the Hot Dry Rock Assessment Panel)

Subtitle- Status of Exploration and Assessment

Author(s)- / Combs , J. / Mallis , R. / McGetchin , T. / Rowley , J.

Publication date- June 1977

Pagination- 218 Pages

Report/patent- ERDA 77-74

Available- NTIS

(Paper copy)

(Microfiche)

Corporate Author- U. S. Energy Research and Development
Administration

Div. of Geothermal Energy

D.C. , USA

Auxiliary expression(s)-

Illus. / Diagram (4) / Graph (9) / Map (40) / Photo (8) /

Table

Descriptor(s)- / Case histories / Coso Hot Springs KGRA / Geothermal exploration / Hot dry rock systems / Marysville KGRA / Mono-Long Valley KGRA / Resource assessment / Valles Caldera Geothermal Field /

Abstract by ERA

The status of knowledge of attempts to utilize hot dry rock (HDR) geothermal energy is summarized. It contains (1) descriptions or case histories of the ERDA-funded projects at Marysville, MT, Fenton Hill, NM, and Coso Hot Springs, CA; (2) a review of the status of existing techniques available for exploration and delineation of HDR; (3) descriptions of other potential HDR sites; (4) definitions of the probable types of HDR resource localities; and (5) an estimate of the magnitude of the HDR resource base in the conterminous United States. The scope is limited to that part of HDR resource assessment related to the determination of the extent and character of HDR, with emphasis on the igneous-related type. It is estimated approximately 74 Q (1 Q = 1,000 quads) of heat are stored in these sites within the conterminous U. S. at depths less than 10 KM and temperatures above 150 DEG C, the minimum for power generation. ($Q = 10^{18}$ BTU = 10^{21} J; the total U. S. consumption for 1972 was approximately 0.07 Q). Approximately 6300 Q are stored in the conduction-dominated parts of the crust in the western U. S. (23% of the total surface area), again at depths less than 10 KM and temperatures above 150 DEG C. Nearly 10,000 Q are believed to be contained in crustal rocks underlying the entire conterminous U. S., at temperatures above 150 DEG C. The resource base is significantly larger for lower grade heat.

574. GGIS-100011/0/ / /A/ // //

Title- Hot Dry Rock Systems

(2. Subgroup Paper)

Author(s)- / Brigham , William E. /

Conference- Magnitude and Deployment Schedule of Energy Resources

Publication date- September 1975

Report/patent- CONF--750720-

Abstract by GGIS

Dry hot rock is a rock system at a commercially useful temperature which does not produce fluids at economic rates. These systems each require fracturing and the introduction of water to extract the heat. Resources above 150 DEG C in the continental United States have been estimated at the equivalent of 10 ** 13 bbls. of oil, but considerable research and development will be required to determine whether these resources represent economically recoverable reserves. Because the technology of extraction and the economics of dry hot rock systems are unproven, private industry is unlikely to pursue exploration for, or development of, these systems. Government must take this lead at funding levels of \$200-\$500 million over the next 10-15 years. If successful, a program of exploration and drilling in areas of expected temperatures above 200 DEG C, and field experiments in heat extraction technology, would lead to the construction of a 10 megawatt pilot plant by 1980, and at least one 50 megawatt plant by 1985. The major anticipated institutional problem is the lack of an established body of law dealing with the extraction of heat from such systems. Environmental problems will be similar to those in other geothermal systems. The availability of water for injection into dry hot rock systems may be a special problem.

575. GGIS-100066/J/ / /A/ // //

Title- How to Avoid Errors in Predicting Geopressures

Author(s)- / Pilkington , P.E. / Fertl , W.H. /

Publication date- Vol. 184 , Issue 7 , 1977

Pagination- Page 85 , 5 Pages

Descriptor(s)- / Geopressure / Geopressure exploration / Well logging

Abstract by Compendex

The ability to locate and quantitatively evaluate overpressured formations encountered world-wide is critical to drilling operations, completion techniques and development of exploratory and reservoir engineering concepts for the world's hydrocarbon resources. This discussion evaluates the potential of drilling and well log information in current abnormal pressure detection technology. Special emphasis is focused on limitations and possible pitfalls as experienced throughout the world. Abnormal formation (pore) pressures are defined as any departure from the normal hydrostatic pressure gradient at any given depth.

576. GGIS-100002/O/ / 3/A/ // //

Title- How to Predict Formation Pressures of Cretaceous-Jurassic Age Sediments

Subtitle- Mississippi

Author(s)- / Matthews , W. R. / McClendon , R. T. / Sourck , C. R. /
Conference- Abnorm. Subsurf. Pressure
Baton Rouge
Louisiana
USA

Publication date- Vol. 3 , 1972

Pagination- Page 137 , 4 Pages

Auxiliary expression(s)-

Illus. / Sketch map (1) /

Descriptor(s)- / Mississippi / Engineering geology / Geopressured
reservoirs / Overburden pressure / Gulf Coast / Pressure buildup
/ Geopressure / Prediction / Shale / Well logging / Jurassic /
Cretaceous / United States / Texas / Arkansas / Florida /

577. GGIS-100268/J/ / /A/ // //

Title- How to Stop Worrying About Natural Gas

Author(s)- / Faltermayer , Edmund /

Journal- Fortune

Publication date- Vol. 96 , Issue 2 , August 1977

Pagination- Page 156 , 8 Pages

Auxiliary expression(s)-

Illus. / Photo (2) /

Descriptor(s)- / Charges / Economic impact / Gas production /
Geopressure resources / Institutional aspects / Methane /
Natural gas / Reserves /

Abstract by Energyline

The prospect that the U.S. will run out of natural gas reserves in the near future is dismissed. There is enough gas available to accomodate most present users. It is possible that unconventional sources of gas might extend the gas era much farther in to the future. Current gas production rates and supplies are surveyed. Low priority gas users, such as industrial plants, should switch to coal as a fuel source to extend the present gas supplies for high priority uses, such as the heating of homes and stores. The economic prospects for utilizing geopressured methane resources are assessed. Factors affecting natural gas prices on the world market are reviewed. Natural gas price control policies are explored. Price decontrol is also considered. Recommendations are detailed.

578. GGIS-100066/J/ / /A/ // //

Title- How Downhole Temperatures, Pressures Affect Drilling; Part 6

Subtitle- Correlating Geopressure Gradients with Hydrocarbon Accumulations

Author(s)- / Timko , D. / Fertl , W.H. /

Publication date- Vol. 175 , Issue 6 , November 1972

Pagination- Page 79 , 4 Pages

Auxiliary expression(s)-

Illus. / Figure (6) /

Table

Ref.

Descriptor(s)- / Bottom hole pressure / Bottom hole temperature /
Depth / Distribution / Drilling / Geopressure gradients /
Hydrocarbons / Pressure gradients / Reservoir properties /
Temperature distribution /

Abstract by WRA

Geopressure gradients are correlated with the spatial and
depth distribution of hydrocarbon accumulations.
Temperature-pressure-depth relationships and abnormal pressure
conditions can be related to gas and oil fields, even size of
reservoirs. In addition, some reasons why gas occurrence
predominates at deeper depths are suggested.

579. GGIS-100393/O/ / /A/ / / / /

Title- Hydrocarbon Source Facies Analysis, Department of Energy and
General Crude Oil Company Pleasant Bayou No. 1 and 2 Wells,
Brazoria County, Texas

Author(s)- / Brown , Stephen W. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 1 , June 1980

Pagination- Page 132 , 21 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

78712

(Paper copy)

Local Availability- CES

Auxiliary expression(s)-

Illus. / Figure (4) /

Descriptor(s)- / Brazoria County / Cuttings analysis / Exploitation /
Facies / Geopressured zones / Hydrocarbons / Methane / Pleasant
Bayou No. 1 Well / Pleasant Bayou No. 2 Well / Vitrinite /
Maturation / Reflectance /

Abstract by Author

The stratigraphic section penetrated by the No. 1 and No. 2
Pleasant Bayou Wells, Brazoria County, Texas, over the gross
well interval 2,072 feet to 16,500 feet, contains zones with
little or no potential for indigenously generated hydrocarbons.
With the exception of a very thin interval at approximately 7,000
feet, the entire evaluated section is considered immature and
organically lean and has no significant potential for generating
producable quantities of either liquid or gaseous hydrocarbons.
The organic rich interval, which extends from approximately
6,800 feet to 7,400 feet, contains significant amounts of coal
which may have generated large quantities of "dry" methane gas
during the coalification process. Although large quantities of
methane were not detectable within these sediments, the

Geopressured Geothermal Bibliography

possibility exists that producible accumulations may exist within this interval in the local vicinity of this well.

580. GGIS-100999/O/ / /A/ / / / /

Title- Hydrocarbon Working Fluid and Operating Conditions Selection for the Conventional Geothermal Binary Cycle

Author(s)- / Iqbal , K.B. / West , H.H. / Starling , K.E. /

Conference- 13th Intersociety Energy Conversion Engineering Conference

Pagination- Page 1114 , 7 Pages

Report/patent- SAE--789314

Note- Work supported by the University of Oklahoma and the Department of Energy.

Corporate Author- Oklahoma Univ., Norman

Norman , Oklahoma , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (1) /

Table

Ref.

Descriptor(s)- / Binary cycle power generation / Geothermal energy conversion / Hydrocarbons / Rankine cycle / Working fluids / 2-methylpropane /

Abstract by Author

The subject of selecting working fluid and process operating conditions for the geothermal binary power cycle is addressed herein. To examine a wide variety of potential working fluids, a fluid screening procedure was developed. The first phase of the three phase screening procedure permits a quick evaluation, with potential working fluids identified for more detailed analysis. The second phase screening procedure requires more thermophysical property data for the potential working fluid in order to evaluate a series of cycle parameters. The final phase of the screening procedure requires evaluation with the aid of a power cycle simulation program complete with rigorous thermodynamics, process, and economic estimation routines. The working fluids compared in detail herein include isobutane, isopentane, cis-2-butene, R-11, R-114 and an equimolar mixture of isobutane and isopentane. It is concluded that the range of working fluids considered by the industry to date has been too limited.

581. GGIS-100285/J/ / /A/ / / / /

Title- Hydrochemical Anomalies in Petroleum- and Gas-Containing Geopressured Water Systems

Author(s)- / Kolodii , V.V. /

Publication date- Russian

Pagination- Page 19 , 8 Pages

Descriptor(s)- / Chemical analysis / Geopressured systems / Geopressured zones / Geothermal fluids / Natural gas / Petroleum exploration / Water chemistry /

582. GGIS-100053/J/ / 2107/A/ // //

Title- Hydrodynamics of Geopressure in the Northern Gulf of Mexico Basin

Author(s)- / Jones , P. H. /

Journal- Journal of Petroleum Technology

Publication date- Vol. 21 , Issue 7 , July 1969

Pagination- Page 803 , 8 Pages

Abstract by GGIS

Analysis of information on the geochemical and geophysical features of geopressed reservoirs in the northern Gulf of Mexico basin reveals that the behavior of water in these systems is non-Newtonian, that the hydrodynamic forces are gravity related, and that the dominant hydrodynamic mechanisms (osmosis, diagenesis and terrestrial heat flow) are molecular. These hydrodynamic mechanisms are affected by the hydrologic environment, the environment itself being a function of the geophysical and geochemical characteristics of the reservoir. Geophysical and geochemical features that contribute significantly to the hydrologic environment are 1) the geotemperature regime, 2) the clay/mineral abundance ratio of the sediments, and 3) the range and depth of the distribution of formation water salinity.

583. GGIS-100052/J/ / /A/ // //

Title- Hydrodynamics of Geopressure in the Northern Gulf of Mexico Basin

Author(s)- / Jones , P. H. /

Publication date- July 1969

Descriptor(s)- / Geophysics / Geopressed systems / Geothermal resources / Gulf of Mexico / Hydrodynamics / Louisiana / Rocks / Texas / USA / Water /

584. GGIS-100051/J/ / 205/A/ // //

Title- Hydrogeologic Aspects of Structural Deformation in the Northern Gulf of Mexico Basin

(Growth Faults, Geopressed Water, Upper Tertiary Deposits)

Author(s)- / Jones , Paul H. / Wallace , Raymond H., JR. /

Publisher- U. S. Geological Survey

Journal- Journal of Research U.S. Geological Survey

Publication date- Vol. 2 , Issue 5 , 1974

Pagination- Page 511 , 7 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Gulf Coast / Sedimentary structures / Sediments / Marine geology / Faults / Sedimentary petrology / Soft sediment deformation / Pore water / Gulf of Mexico / Mechanics / Texas / Louisiana / Mississippi / Geopressure / Geophysical surveys / Seismic surveys / Continental Shelf / Pressure buildup /

Tertiary / Upper Tertiary / United States / North / Ground water
/ Aquifers / Pore pressure /

Abstract by Author

The resistance of unconsolidated clastic sediments to structural deformation, an inverse function of their water content and pore pressure (commonly defined in terms of rock density and geostatic ratio), has no uniform relation to depth of burial in the Gulf Basin. Dumped along the northwestern margin of the Gulf Coast geosyncline at a very rapid rate, the sediments of younger deltas leapfrogged older deltas and spilled gulfward upon prodelta and marine clay components of the older deltas, burying them deeply before they could drain properly in response to compaction stress of the overburden load. Contemporaneous gravity faults of major dimension occur along gulfward margins of delta-front sand bodies, reflecting the effect of sediment-facies distribution on resistance to shear--sand bodies are more stable than shale bodies. Such contemporaneous faults, known locally as growth faults, are the most distinctive feature of Gulf Basin geology; they are normal faults with a progressive increase in throw with depth, and across which, from the upthrown to the downthrown block, there is great thickening of correlative sections. In plan and profile, faulted masses resemble land slides; fault planes are concave gulfward and upward, the dip decreasing with depth until the fault plane parallels the bedding plane. Movement on the fault rotates the block, causing reversal of the dip of beds in the block and sealing the landward ends of included aquifers to discharge of waters of compaction--producing the geopressured conditions so common in the Gulf Coastal Plain and Continental Shelf. Development of geopressure in the block early in its tectonic history reduces resistance to shear, and progressive loading on the landward side of the block sustains the rotational stress. Flow of geopressured water into the fault zone--the easiest route of escape--reduces drag and facilitates movement on the fault.

585. GGIS-100003/0/ / 2411/A/ / / / /

Title- Hydrogeologic Aspects of Structural Deformation in the Northern Gulf of Mexico Basin

(Abstract. No Uniform Relation to Depth, Normal Faults, Geopressure Reduces Resistance to Shear, Rotational Stress.)

Conference- International Geol. Congr.

Publication date- Vol. 24, Issue 11

Pagination- Page 72

Descriptor(s)- / Gulf of Mexico / Ground water / Sediments / Faults / Hydrogeology / Aquifers / Thermodynamic properties / Displacements / North / Pore water / Diagenesis / Geopressure / Normal /

586. GGIS-100003/0/ / 2411/M/ / / / /

Title- Hydrology

(Section 11)

Original Title- Hydrologie
 Conference- International Geol. Congr.
 Publication date- Vol. 24 , Issue 11

587. GGIS-100005/0/ / 3/A/ / / / /

Title- Hydrothermal Geothermal Resources and Growth in Utilization

Conference- Energy Technology II

Publisher- Govt. Inst., INC.

Washington, D.C.

Publication date- Vol. 3 , March 31 , 1976

Pagination- Page 103 , 12 Pages

Corporate Author- Electric Power Research Institute

Auxiliary expression(s)-

Illus. / Graph (6) / Table (6) /

Descriptor(s)- / Geothermal energy / Hot water / Geothermal resources
 / Comparative evaluations / United States West / Geothermal
 power plants / Geysers / Steam /

Abstract by Energyline

Although water dominated hydrothermal geothermal systems produce significant amounts of electric power in several countries, its commercialization has not been demonstrated in the U.S. Use of geopressure and hot dry rock geothermal resources is still in the R&D stage and is not likely to have an impact on total geothermal energy power production until the last decade of the century, so use of the hydrothermal resources is of paramount importance in the near to mid-term development of a U.S. geothermal industry. An analytical relationship is developed between the temperature and the number of hydrothermal systems. The information is sufficient to estimate various levels of potential development of hydrothermal resources with temperatures high enough for electric power generation in the 11 western states. Previous estimates of the growth of geothermal electric power production are examined and found to be too high for 1985. The present estimate is 4,000 MW installed. (6 graphs 6 tables)

588. GGIS-100518/R/ / /M/ / / / /

Title- Identification of Geopressed Occurrences Outside of the Gulf Coast

Subtitle- Final Report, Phase I

Author(s)- / Strongin , O. /

Publication date- September 30 , 1980

Pagination- 147 Pages

Report/patent- DOE/NV/10133-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80NV10133 /

Corporate Author- Science Applications, Inc.

McLean , VA , USA

Geopressured Geothermal Bibliography

Descriptor(s)- / Alaska / Appalachia / California / Depositional environment / DOE / Geologic ages / Geopressured reservoirs / Geopressured zones / Lithology / Oklahoma / Pacific Ocean / Resource assessment / USA /

Abstract by NTIS

As an extension of its efforts in the development of the geopressured resources of the Gulf Coast, the Division of Geothermal Energy of the US Department of Energy is interested in determining the extent and characteristics of geopressured occurrences in areas outside the Gulf Coast. The work undertaken involved a literature search of available information documenting such occurrences. Geopressured reservoirs have been reported from various types of sedimentary lithologies representing virtually all geologic ages and in a host of geologic environments, many of which are unlike those of the Gulf Coast. These include many Rocky Mountain basins (Green River, Big Horn, Powder River, Wind River, Uinta, Piceance, Denver, San Juan), Mid-Continent basins (Delaware, Anadarko, Interior Salt, Williston, Appalachian), California basins (Sacramento, San Joaquin, Los Angeles, Ventura, Coast Ranges), Alaskan onshore and offshore basins, Pacific Coast offshore basins, and other isolated occurrences, both onshore and offshore.

589. GGIS-100545/R/ / /M/ / / / /

Title- Identification of Geopressured Occurrences Outside of the Gulf Coast

Author(s)- / Strongin, O. /

Publication date- March 5, 1981

Pagination- 114 Pages

Report/patent- DOE/NV/10133-2

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80NV10133 /

Corporate Author- Science Applications, Inc.

McLean, VA, USA

Descriptor(s)- / Appalachia / California / Cretaceous Period / Devonian Period / Geology / Geopressure exploration / Geopressured systems / Miocene Epoch / Pressure gradients / San Joaquin Valley / West Virginia /

Abstract by (Unknown)

The work focused on the occurrences of geopressures in Appalachia and selected California basins. In the former region, where geopressures have been observed, the pressure gradients for the most part were only slightly above normal as in the case of the Oriskany formation of Devonian age; this unit was also characterized by extremely high salinity. The one notable exception was in the Rome trough of West Virginia where Cambrian beds at depths below 10,000 feet display very high geopressures, approaching the lithostatic gradient, and the waters are only moderately saline. Though the geothermal gradient throughout Appalachia is relatively low, even in the Rome trough, the pressure, temperature and salinity values in this area indicate that the methane content of the Cambrian formation waters is in the range of 30 to 35 SCF/barrel. The two California areas researched included the contiguous Sacramento and San Joaquin

Valleys. In the first, geopressures have been principally encountered in the Forbes formation of Cretaceous age, often at very shallow depths. Further waters are invariably characterized by very low salinity, far below the salinity of normal sea water, while the geothermal gradient is apparently higher in geopressured than in normally pressured zones. In the San Joaquin Valley, geopressures are particularly noteworthy in at least two formations of Miocene age at depths generally greater than those of the Forbes. The formation waters are likewise low in salinity; however, the geothermal gradient, especially in the geopressured zones on the west side of the valley, can be extremely high, up to twice as much as the normal temperature gradient. In view of these conditions, it is estimated that in the western San Joaquin Valley the methane content of geopressured formation waters will range from 30 to 40 SCF/barrel while in the Sacramento Valley, the methane content is estimated to be 20 to 25 SCF/barrel.

590. GGIS-100533/O/ / /A/ / / / /

Title- Identification of Geothermal Reserves and Estimation of Their Value

Author(s)- / Howard , J.H. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 3 , 10 Pages

Local Availability- GGIS

Corporate Author- California Univ.
Lawrence Berkeley Lab.
Berkeley , USA

Auxiliary expression(s)-

Illus. / Graph (4) /

Table

Ref.

Descriptor(s)- / Cost / Energy reserves / Evaluation / Exploitation /
Geothermal resources / Investment / Ownership /

Abstract by GGIS

This procedure for estimating hot water geothermal property value from the owner's point of view consists of two methods, one "conservative" and one "optimistic." This value in both cases is estimated to equal the present value of future income less the cost of resource extraction.

591. GGIS-100407/O/ / /A/ / / / /

Title- Identification of Prospective Industrial Geothermal Energy Users

Author(s)- / Coe , Barbara A. / Bright , Paul /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
Salt Lake City

Geopressured Geothermal Bibliography

Utah
USA (September 9 , 1980)
Publisher- Geothermal Resources Council
Davis, CA
Publication date- Vol. 4 , 1980
Pagination- Page 553 , 3 Pages
Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts
Available- Geothermal Resources Council
P.O. Box 98
Davis
CA
95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (1) /

Table

Ref.

Descriptor(s)- / Commercialization / Cost benefit analysis /
Economics / Geothermal energy / Industrial plants / Market /
Optimization / Planning / Regional analysis / Resource potential
/ Site selection /

Abstract by GGIS

Identification of prospective geothermal energy users from the industrial sector is dependent upon understanding the essential criteria industry uses for plant siting. Typically, such factors as the availability of labor, raw materials and transportation facilities are weighted more heavily than energy concerns. The complexity of plant siting precludes a decision based solely on geothermal temperature compatibility with required plant process temperatures, for example. Systematic identification of geothermal users is suggested: 1) identify essential siting criteria (recent industrial location trends are discussed in this report) and match with known geothermal sites; 2) generate a list of industries that show potential for geothermal energy use; and 3) investigate those industries in depth and target them for further marketing.

592. GGIS-100097/R/ / /M/ / / / /

Title- Impact of State and Federal Law on Development of Geothermal Resources in Texas

(Project L/R-9, Final Report)

Author(s)- / Edwards , T. /

Publisher- National Science Foundation
Washington, D.C.

Report/patent- NSF-RA--74-244

Corporate Author- State of Texas
Governor's Energy Advisory Council
Austin , Texas , USA

Descriptor(s)- / Geopressured systems / Geothermal exploration /
Geothermal fields / Geothermal fluids / Geothermal resources /
Regulations / Texas /

Abstract by ERDA/RECON

The significant geothermal resource in Texas consists of enormous reservoirs of hot, geopressured water formed along the

Gulf Coast when water-laden sediments were deposited between surrounding impermeable features, so that the water which would otherwise have been forced out of the sediments was unable to escape. These deposits exist under tremendous pressure created by the weight of the overburden. A geopressure source absorbs heat indirectly, because the geopressured deposits create an insulating barrier that traps and absorbs the thermal energy of the underlying magma. The water from a geopressure source will not be as hot as water from a dry steam or wet steam source, but the quantity available is enormous, and the water pressure itself would be an additional energy source along with the thermal energy. The water may be fresh, or nearly so, and it will contain significant amounts of recoverable methane gas in solution. It may be possible to utilize the water pressure, thermal energy, and the methane gas to generate electricity in small power plants at the recovery site, and the water that has been passed through the turbines and heat exchangers may be a valuable by-product in itself, depending on its quality and regional demands for agriculture and industry. One of the impediments to the development of this resource, given the very sizable commitments of capital entailed, is the uncertain legal status of geothermal resources. This report attempts to locate geothermal resources within the general framework of Texas Property Law and to determine whether these resources can be developed under the law as it now exists. (MCW)

593. GGIS-100532/O/ / /A/ / / / /

Title- Imperial Valley's Proposal to Develop a Guide for Geothermal Development Within Its County

Author(s)- / Pierson , David E. /

Conference- Conference on Research for the Development of Geothermal Energy Resources
Pasadena

CA (September 23 , 1974)

Publication date- December 31 , 1974

Pagination- Page 160 , 4 Pages

Local Availability- GGIS

Corporate Author- Imperial County of Public Works
El Centro , CA , USA

Descriptor(s)- / Energy source development / Geothermal resources /
Government policies / Imperial Valley / Planning /
Recommendations / Research programs /

Abstract by Author (revised)

The purpose of this project is to establish the geothermal element for Imperial County's General Plan. Research for the development of this plan should show the general location in which development could occur, the economic tradeoffs of geothermal development, the sociological, geographic, land use, and environmental effects, plus geological and engineering study.

594. GGIS-100023/J/ / 5910/A/ / / / /

Geopressured Geothermal Bibliography

Title- Importance of Aquathermal Pressuring Effect in Gulf Coast

Author(s)- / Magara , K. /

Publisher- American Association of Petroleum Geologists

Journal- American Association of Petroleum Geologist Bulletin

Publication date- Vol. 59 , Issue 10 , 1975

Pagination- Page 2037 , 9 Pages

595. GGIS-100308/O/ / /A/ / / / /

Title- Important Conclusions Based on Results of Geothermal Casing
Packer Seal Elastomers Testing

Author(s)- / Hirasuna , A.R. / Stephens , C.A. / Veal , G.R. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 279 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- L'Garde, Inc.

Newport Beach , California , USA

Auxiliary expression(s)-

Illus. / Photo (8) /

Table

Ref.

Descriptor(s)- / Elastomers / Elevated temperatures / Geothermal well
/ Seals / Well casings /

Abstract by Author

Development of casing packer seal elastomers sponsored by the Department of Energy, Division of Geothermal Energy, was initiated in late 1976. Special evaluation tests were designed and fabricated to simulate the unusually severe environment and to evaluate critical characteristics. Testing to date indicates fundamental deficiencies will exist with current day packer systems operating at higher geothermal temperatures.

596. GGIS-100995/ / / /A/ / / / /

Title- Improved Geothermal Drilling Fluids

Author(s)- / McDonald , William J. / Remont , Larry J. / Carwile ,
Clifton /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 419 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Illus. / Graph (5) /

Table

Ref.

Descriptor(s)- / Cost / Drilling fluids / Elevated temperature /
Filtration / Geothermal drilling / Geothermal reservoirs / Lost
circulation / Rheology /

Abstract by Author (rev.)

Most constituents of drilling fluids start degenerating slowly at temperatures above 150 DEG C. The rate degeneration increases with temperature but mud properties can be maintained up to about 200 DEG C by the replacement of degraded components. Breakdown is rapid above that temperature and there is no existing drilling fluid which retains its required rheological and filtration control properties above 250 DEG C. Improved geothermal drilling fluids will reduce well costs 10% and reduce the cost of power-on-line 3 to 5%. One new mud system to accomplish this has been developed and will be field tested soon. Laboratory work is continuing for further improvements. Also, a concerted effort is underway to assure application and utilization of the best available geothermal drilling fluid technology.

597. GGIS-100241/O/ / /A/ / / / /

Title- Income Taxation of Geothermal Resources

Author(s)- / Maxfield, P. C. /

Conference- Geothermal Resources Development Institute Conference

Salt Lake City

Utah

USA (January 27 , 1977)

Publisher- Rocky Mountain Mineral Law Foundation

Boulder, CO

Publication date- January 27 , 1977

Pagination- 51 Pages

Report/patent- CONF-770135-- / Geothermal resources / Laws / Resource
depletion / Taxes /

Abstract by TIC

The state of the law with regard to geothermal resources is outlined. Because the federal income tax laws relating to mineral exploration and development to a great extent turn at least indirectly on the specific depletion laws applicable to the various forms of geothermal energy, and the type of depletion allowable, i.e., statutory (percentage) and/or cost, it appears necessary to eschew herein a transactional type of approach that would proceed from acquisition to exploration, to development, to operation, to disposition in favor of the keystone questions, i.e., the allowability of depletion vel non and the type(s) of depletion allowable. These other subjects are examined primarily in so far as there are tax problems peculiar to the fledgling geothermal industry-- or in so far as there is uncertainty as to applicability of otherwise settled law. (MHR)

598. GGIS-100240/J/ / /A/ / / / /

Title- Income Taxation of Geothermal Resources

Author(s)- / Maxfield , Peter C. /

Journal- Land Water Law Review

Publication date- Vol. 13 , Issue 1 , 1977

Pagination- Page 217 , 42 Pages

Auxiliary expression(s)-

Ref. / Geothermal resources / Laws / Resource depletion / Taxes /

Abstract by EIC

The state of federal tax laws applicable to some activities and transactions relating to geothermal resources is embryonic. The allowability of depletion velnon and the types of depletion allowable are examined in so far as they are problems peculiar to the fledgling geothermal industry. Geothermal resource depletion as a gas and not as a gas is considered.

599. GGIS-100024/B/ / 11/A/ / / / /

Title- Increasing Occurrence of Abnormally High Reservoir Pressures in Boreholes, and Drilling Problems Resulting Therefrom

(Paper 2 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)

Author(s)- / Thomeer , J. H. M. A. / Bottema , J. A. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 11 , 1974

Pagination- Page 27 , 10 Pages

Descriptor(s)- / Engineering geology / Geopressured reservoirs / Overburden pressure / Geopressure / Boreholes / Oil and gas fields / Drilling / Control / Permian period / Tertiary period / Europe / German Democratic Republic / Asia / Pakistan / New Guinea /

Abstract by Author

Under normal conditions fluid pressures in underground reservoirs will be hydrostatic, i.e., in equilibrium with the weight of a (salt) water column extending from reservoir level to surface. Such hydrostatic pressures can be easily controlled by using a mud flush only slightly heavier than water. Reservoir pressures higher than hydrostatic are not uncommon, however, and a theory is given explaining the why and when of their occurrence. Composition and previous sedimentation rate of overburden are controlling factors, as are the age and geologic history of formations concerned. Maximum possible reservoir pressure to be encountered is petrostatic, i.e., in equilibrium with weight of overburden. The control of such excessive reservoir pressures in drilling wells requires mud weights, which, in extreme cases, may be equal to or even in excess of overburden weight. These latter pressures will unavoidably cause incurable circulation losses by squeeze action, and under appropriate conditions even less high mud weights may have the same effect. A very serious problem is thus created. Critical situations of this nature are not uncommon and would appear to require greater attention and more study. A few practical

experiences of more recent date (North Germany, Netherlands New Guinea, West Pakistan) are discussed. From both theory and field experience it appears that with proper care and precaution no unsurmountable difficulties need generally be anticipated in drilling through rocks with reservoir pressures not exceeding 80-90% of overburden pressure. For cases of still higher pressures (90-100%), however, the problem seems still far from solved.

600. GGIS-100024/B/ / 11/A/ // //

Title- Indication of Proximity of High Pressure Fluid Reservoir, Louisiana and Texas Gulf Coast

(Paper 7 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)

Author(s)- / Forgotson , James M., SR. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 11 , 1974

Pagination- Page 119 , 3 Pages

Descriptor(s)- / Gulf Coast / Engineering geology / Geopressured reservoirs / Overburden pressure / Texas / Louisiana / Geopressure / Pore water / Release / Faults / Shale / Oil and gas fields / United States /

Abstract by Author

The author suggests that a method is available to Gulf Coast operators for detecting the proximity of high-pressure fluid reservoirs. Use of this method may avoid costly blowouts or saltwater flows. Mud logging companies have reported that the presence of high background gas and high trip gas, together with lower than normal shale density, may signify the proximity of a high-pressure fluid reservoir. The author, however, found that in many areas low-density shales are not accompanied by other background gas or trip gas. Even the presence of low-density shale and low resistivity on an electric log does not indicate the proximity of such a high-pressure fluid reservoir. What the author has found is that a minimum increase of 200 percent in the shale penetration rate indicates that a high-pressure fluid reservoir is nearby.

601. GGIS-100424/O/ / /A/ // //

Title- Industrial Markets for the Texas Geopressured Geothermal Resource

Subtitle- A Market Survey

Author(s)- / Roberts , Kenneth D. / Prestwood , Donna C. L. / Frederick , David O. / Vanston , John H. /

Conference- Geothermal Resources Council 3rd Annual Meeting Trans. (Expanding the Geothermal Frontier)

Reno

Nevada

USA (September 24 , 1979)

Publication date- Vol. 3 , 1979

Pagination- Page 577 , 4 Pages

Available- Geothermal Resources Council

Geopressured Geothermal Bibliography

P.O. Box 98
Davis
CA
95616

Corporate Author- Texas Univ.
Center for Energy Studies
Austin, USA

Auxiliary expression(s)-
Illus. / Map (1) /
Table

Descriptor(s)- / Commercialization / Financial incentives /
Geopressure resources / Gulf Coast / Industry / Market / Methane
/ Process heat / Texas / Uses /

Abstract by Energyline

A survey of 267 low grade process heat users along the Texas Gulf Coast was conducted to define the potential market for the thermal or combined thermal-methane components of the underlying geopressured resource. Analysis indicates that low anticipated capital replacements and the existence of unused low grade heat limit the potential market. Methane is the major fuel of all industry groups, though substitution to another fuel is anticipated. Successful commercial application, followed by reservoir insurance, will stimulate participation more than any other incentives could.

602. GGIS-100562/R/ / /M/ / / / /

Title- Industry Participation in DOE-Sponsored Geopressured
Geothermal Resource Development
(Interim Report, September 12, 1977 - April 13, 1978)

Author(s)- / Coffey, H.F. /

Publication date- 1978

Pagination- 319 Pages

Report/patent- NVO-1531-1

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)
AC08-77ET28459 /

Corporate Author- GeoEnergy Corp.
Las Vegas, NV, USA

Descriptor(s)- / Geopressure resources / Industry / Meetings /
National government / Research programs / Resource assessment /
State government /

Abstract by NTIS

An industry forum for detailed discussions of the DOE resource evaluation program was instituted. An Overview Group was established along with four working subgroups--Site Selection, Drilling and Testing, Environmental/Laboratory Research, Legal/Institutional--at the initial forum meeting. All forum meetings are open to the public and are announced in the Federal Register. To date, 12 meetings have been conducted including two overview, two site selection, three drilling and testing, three environmental/laboratory research and two legal/institutional meetings. The meetings have been well attended. Representatives of 15 of the 19 largest US oil companies as well as 12 other major industrial firms have participated. In addition, 25 small businesses, 12 DOE

contractors, 8 state agencies and 6 federal government agencies have been represented. Discussions have been open and spirited resulting in a useful interchange of ideas. The enthusiastic cooperation of the participants has demonstrated the ability of the government and industry to work harmoniously on programs aimed at solving the energy crisis.

603. GGIS-100381/R/ / /M/ / / / /

Title- Industry Participation in DOE-Sponsored Geopressured Geothermal Resource Development

Subtitle- Final Report for September 1, 1977 - April 30, 1979

Author(s)- / Coffey, Henry F. /

Publication date- 1980

Pagination- 453 Pages

Report/patent- DOE/ET/28459-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA). Div. of Geothermal Energy
AC08-77ET28459 /

Corporate Author- GeoEnergy Corp.

Las Vegas , NV , USA

Auxiliary expression(s)-

Illus. / Diagram (32) / Graph (26) / Map (42) /

Table

Ref.

Descriptor(s)- / Energy source development / Drilling / Environmental effects / Geopressure resources / Geothermal resources / Government policies / Ground water recharge / Gulf Coast / Industry / Institutional aspects / Laboratory studies / Legal aspects / Permeability / Salt water / Site selection / Testing / Waste disposal /

Abstract by Author

Under contract to the Department of Energy (DOE), C.K. GeoEnergy Corporation (CKG) has carried out a series of DOE/Industry forums to keep industry advised of the DOE program to develop the geopressured geothermal resources of the Gulf Coast. A total of eighteen meetings were held with registered attendance of 621 representing a good cross section of industry, state, and federal agencies. An Overview Group and four working subgroups - Site Selection, Drilling and Testing, Environmental/Laboratory Research, and Legal Institutional were established to subdivide the DOE programs into areas of interest and expertise. During the contract period three Overview, four Site Selection, three Drilling and Testing, five Environmental/Laboratory research and three Legal/Institutional meetings have been conducted. Interest in and attendance at the meetings continue to grow reflecting increased industry contact with the DOE Geopressured Geothermal Resource Development Program. Two other studies were carried out for DOE under this contract; a Salt Water Disposal Study and an Industry Survey to evaluate the DOE Resource Development Program. The Salt Water Disposal Study reviewed subsurface salt water disposal experience on the Texas and

Louisiana Gulf Coast. This preliminary study concluded that subsurface brine disposal should be possible in the areas of interest with adequate evaluation of the geology of each area and a well designed and constructed surface and subsurface facility. The industry survey indicated general satisfaction with the technical design of the resource evaluation program but felt the program should be moving faster. Excellent communication with industry had been maintained through the forum meetings and the status reports. Two major problems remain: uncertainties about reservoir continuity and permeability. These will govern the rates at which the hot water can be produced and the production life of the reservoir. Industry is vitally interested in the results of the current tests and those planned in the future to determine if this huge energy source can be produced economically.

604. GGIS-100469/R/ / /M/ / / / /

Title- Initiatives With Potential for Reducing Imports of Oil and Gas

(Presentation to the Department of Energy)

Subtitle- Near Term to 2020

Publication date- May 1978

Pagination- 389 Pages

Report/patent- M78-34

Available- Metrek Division of the Mitre Corporation

1820 Dolley Madison Boulevard

McLean

VA

22101

Local Availability- GGIS

Corporate Author- Mitre Corp.

METREK Div.

McLean , VA , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (5) /

Table

Ref.

Descriptor(s)- / Cost / Economic impact / Economics / Energy conservation / Energy consumption / Energy demand / Energy supplies / Natural gas industry / Petroleum / Petroleum industry / Recommendations / Trade /

Abstract by Author (revised)

The objective of this study is to explore opportunities for reducing oil and gas imports to the year 2020, and the document is being distributed with the intention of presenting material for discussion and further analysis. Options for reducing oil imports that are analyzed in this report include: additional supplies of domestic energy; substitutes for oil and gas; and conservation/demand reduction. The impact of these options on the economy with respect to inflation, employment, economic dislocations and regional effects have not been assessed; thus no recommendations are made. For each option a statement of conditions necessary to achieve that option is given. Four time periods are covered in the report: near term to 1985; 1985 to 1990; 1990 to 2000; and 2000 to 2020.

605. GGIS-100330/R/ / /M/ / / / /

Title- Injection, Injectivity, and Injectability in Geothermal Operations

(Phase I - Definition of the Problem)

Subtitle- Problems and Possible Solutions

Author(s)- / Vetter , O.J. / Crichlow , H.B. /

Publication date- February 14 , 1979

Pagination- 176 Pages

Report/patent- SAN-2044-1

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

ET-78-C-03-2044 /

Auxiliary expression(s)-

Table

Illus. / Graph (16) / Diagram (26) / Figure (1) /

Ref.

Appendix

Descriptor(s)- / Environmental effects / Geothermal brines /
Geothermal wells / Injectability / Injection wells / Injectivity
/ Scaling / Well stimulation /

Abstract by Author

A definition study of geothermal reinjection problems was conducted. The wide spectrum of problems related to the reinjection of heat-depleted brines was outlined. Emphasis was focused on problems relating to both injectivity and injectability. The main objectives of the study were to define the problems and to suggest further R & D work. It can be stated that the geothermal reinjection technology is in desperate need of development. No refined and readily useable technology for reinjection seems to exist. Top priority problems (problems which must be solved for the geothermal industry to survive) include: 1) suspended particles and their effects on injectability and injectivity; 2) scale formation in the entire injection system; 3) well stimulation techniques must be developed; 4) need for new tracer technology is strongly indicated; 5) organizational difficulties. Medium priority problems (problems which should be attacked to allow an economic operation of the geothermal industry) include: 1) improvement of engineering technology used for optimization of energy recovery through proper heat-timing; 2) major environmental problems in combination with technology aimed at improvement of reinjection operations; 3) improvement of drilling and well completion technology. Low priority problems (problems which should be handled to improve the cost-efficiency and provide long-term stability of the geothermal industry) include: 1) fundamental research not directly related to solving top and medium priority problems; 2) minor environmental problems which still permit operation within guidelines of compliance. This report proposes an R & D framework to solve many of the outlined problems. It involves: 1) a coherent combination of theoretical, laboratory and field experiments; 2) transfer of advanced technology from other fields of science and its

Geopressured Geothermal Bibliography

adaption to geothermal operations; 3) coordination of R & D work aimed at solving production and injection problems.

606. GGIS-100532/O/ / /A/ / / / /

Title- Institutional and Environmental Problems in Geothermal Resource Development

Author(s)- / Maslan , Frank / Gordon , Theodore J. / Deitch , Lillian

Conference- Conference on Research for the Development of Geothermal Energy Resources
Pasadena

CA (September 23 , 1974)

Publication date- December 31 , 1974

Pagination- Page 139 , 21 Pages

Local Availability- GGIS

Sponsor- / National Science Foundation, Washington, D.C. (USA)
NSF-C836 /

Corporate Author- Futures Group
Glastonbury , CT , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Figure (3) / Graph (1) /
Table

Ref.

Descriptor(s)- / Economics / Energy source development /
Environmental policy / Geothermal industry / Geothermal
resources / Institutional aspects / Regulations /

Abstract by GGIS

Institutional and regulatory impediments to the exploration and development of geothermal energy resources and to the necessary marketing of the resource are discussed. Major effects of geothermal development on business and society in the United States are discussed.

607. GGIS-100267/B/ / /A/ / / / /

Title- Institutional Barriers to Geothermal Energy Development

Subtitle- Second Report of the Institutional Barrier Panel to the Geothermal Advisory Council

Author(s)- / Kuhn , Edwin A. /

Publisher- Geothermal World Publications
Reseda, California

Publication date- 1977

Pagination- Page 208 , 7 Pages

Descriptor(s)- / Energy source development / Drilling / Geothermal energy / Institutional aspects / Land leasing / Leases / Leasing / Licensing / Royalties /

Abstract by TIC

In the interim since the First Report to the Council, the Institutional Barrier Panel has met formally on four areas, namely: (1) delays in the issuance of non-competitive leases; (2) drilling permit delays; (3) casual use-- burdensome and discriminatory treatment of lessees; (4) force majeure clause in the lease agreement; (5) assessment of geothermal resources on

Indian lands; (6) steam price review; (7) redefinition of KGRA and reclassification of non-competitive lease tracts; (8) limitation of the Secretary of the Interior's discretion to readjust lease terms and conditions; (9) royalty rebate; and (10) royalty reduction contingencies. Item numbers 1, 2, 3, are outlined as to problem, impact, approach to solution and recommended actions in Section II of this report. Of the remaining items, number 4 has been taken care of through stipulations in the lease agreement; 5 is not perceived as a problem, at this time, because only intermediate temperature resources are thought to exist on Indian Lands (no KGRA's) and a joint USGS/BLM/USBM Mineral Inventory Program will include an assessment program of geothermal energy resources on Indian Lands; items 6 and 10 are pending legal review by BLM; 7 is being handled by a special task force within BLM; 8 requires more information but does not appear to be a formidable problem at this time; item 9, dealing with a recommendation to increase the percentage of the Federal royalty and rentals apportioned to the States, was subsequently enacted through an amendment to the Mineral Leasing Act of 1920 (S.391).

608. GGIS-100443/R/ / /M/ / / / /

Title- Institutional Barriers to Geothermal Energy Development

Subtitle- Second Report of the Institutional Barrier Panel to the Geothermal Advisory Council

Author(s)- / Kuhn, Edwin A. /

Publication date- December 21, 1976

Pagination- 11 Pages

Local Availability- CES

Corporate Author- Geothermal Advisory Council

Institutional Barrier Panel

Washington, DC, USA

Descriptor(s)- / Energy policy / Energy source development / Environmental policy / Geothermal drilling / Geothermal resources / Institutional aspects / Land leasing / Land use / Legislation / Licensing / Regulations / Taxes /

Abstract by Author (rev.)

In the interim since the First Report to the Council, the Institutional Barrier Panel has met formally on four (4) occasions: July 21, August 3, September 29, and November 10, 1976, and considered a total of ten (10) potential problem areas. Of these, the first three (3) listed below were determined to warrant recommendations at this time leading to remedial action either through legislative and/or regulatory amendment or by directed action within the agency concerned with the problem. The ten areas considered are: (1) Delays in the Issuance of Non-competitive Leases; (2) Drilling Permit Delays; (3) Casual Use--Burdensome and Discriminatory Treatment of Lessees; (4) Force Majeure Clause in the Lease Agreement; (5) Assessment of Geothermal Resources on Indian Lands; (6) Steam Price Review; (7) Redefinition of KGRA and Reclassification of Non-competitive Lease Tracts; (8) Limitation of the Secretary of the Interior's Discretion to Readjust Lease Terms and Conditions; (9) Royalty Rebate; (10) Royalty Reduction Contingencies. Item numbers 1, 2, 3, are outlined as to problem, approach to solution and

recommended actions in Section II of this report. Of the remaining items, number 4 has been taken care of through stipulations in the lease agreement; 5 is not perceived as a problem, at this time, because only intermediate temperature resources are thought to exist on Indian Lands (no KGRA's) and a joint USGS/BLM/USBM Mineral Inventory Program will include an assessment program of geothermal energy resources on Indian Lands; items 6 and 10 are pending legal review by BLM; 7 is being handled by a special task force within BLM (the IBP decided to defer recommending action pending receipt of a task force report); 8 requires more information but does not appear to be a formidable problem at this time; item 9, dealing with a recommendation to increase the percentage of the Federal royalty and rentals apportioned to the States, was subsequently enacted through an amendment to the Mineral Leasing Act of 1920 (S.391). The work of the Panel continues to expand and touch new areas of concern to government and industry. Sections III and IV of this report have been added to provide the Council with a broad overview of the status of implementation of recommendations from prior Council action, and to briefly discuss some of the items pending future review by the Panel.

609. GGIS-100308/O/ / /A/ / / / /

Title- Institutional Policy and Planning Issues in Geothermal Development--

Subtitle- The Case of Imperial County

Author(s)- / Edmunds, Stahrl W. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 167 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Table

Descriptor(s)- / California / Cost benefit analysis / Energy source development / Environmental effects / Geothermal energy / Government policies / Legal aspects / Local government / Socio-economic factors /

Abstract by Author

The institutional issues of geothermal development may be analyzed by research which relates resource and engineering assessments to the interests, benefits and costs, associated with a geothermal resource, as they impact various institutional constituencies, like the developers, utilities, county government, agriculturalists, citizens, or unemployed. The sum of the benefits, in the Imperial County case, significantly

exceed costs; and the institutional issues center mainly upon environmental abatement, income distribution effects, and land use. The paper illustrates how these institutional issues can be resolved by policy and planning.

610. GGIS-100407/O/ / /A/ // //

Title- Institutional Standardization of Geothermal Fluid Characterization Techniques

Author(s)- / Kindle , C.H. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 795 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project Manager: Vasek W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy /

Auxiliary expression(s)-

Illus. / Diagram (1) / Figure (1) / Graph (2) /

Ref.

Descriptor(s)- / Comparative evaluations / Fluid sampling /

Geothermal energy / Geothermal fluids / Laboratory testing /

Planning / Recommendations / Research programs / Sampling /

Specifications / Standardization / Standards / Testing / US EPA /

Abstract by GGIS

A program to standardize the methods used to characterize geothermal fluids is described in this article. By standardizing the methodology, the reliability of fluid data will improve. Each stage in the development of standardization is discussed: the research into current industry methodology; evaluation of the methodology using field tests and cooperation between industry and the laboratory; recommendations concerning the methodologies; and institutional standardization.

611. GGIS-100041/J/ / 1108/A/ // //

Title- Instruments and Methods for Measuring Pressures at Depth, Used in Czechoslovakia

Original Title- Merici Pitttroji A Pumucky K Hlubineemu Meremi Tlaku, Pouzivane V CSSR

Author(s)- / Krajca , J. /

Journal- Geol. Prukum.

Geopressured Geothermal Bibliography

Publication date- Vol. 11 , Issue 8 , 1969

Pagination- Page 241 , 4 Pages

Language- Czech

Auxiliary expression(s)-

Sum.

Illus.

Descriptor(s)- / Engineering geology / Measuring methods /
Instruments / Manometers / Geopressure / Boreholes /
Czechoslovakia /

612. GGIS-100003/0/ / /S/ / / / /

Title- International Geol. Congr.

Subtitle- Proceedings

Original Title- Congr. Geol. Int.

Original Subtitle- Programme

Conference- International Geol. Congr.

613. GGIS-100058/J/ / 734/A/ / / / /

Title- Interpreting Pressure Profiles - 1

(2 PTS. in successive issues, Nov. 1975, Vol. 73)

Author(s)- / Gill , J. A. / Gregg , D. N. /

Journal- Oil and Gas Journal

Publication date- Vol. 73 , Issue 46 , November 1975

Pagination- Page 64

Auxiliary expression(s)-

Illus. / Figure (1) /

Ref.

Descriptor(s)- / Australia / Compaction / Continental drift /
Diagenesis / Drilling / Geopressure / Gulf Coast / Indonesia /
North Sea / Permeability / Persian Gulf / Pore pressure /
Sediments / Shale / Trend analysis / Trend maps /

Abstract by GGIS

Many drilling problems can be attributed to pressure-profile problems and misconception. In the North Sea, problems have arisen because of drilling in underbalance in shales and in overbalance in sands. Evidence that pressures originate in compact shales, are generated in young shales (frequently at shallow depths), and are zigzag rather than linear in nature, is found by reading ADT shale parameter plots. Geopressure profiles from geopressured shales in Australia, Indonesia, and the Persian Gulf illustrate these characteristics.

614. GGIS-100997/ / / /A/ / / / /

Title- Interpretive Well-Logging Concepts Solve South Texas Formation-Evaluation Problems

Author(s)- / Fertl , Walter H. /

Conference- Gulf Coast Asso. of Geological Societies 29th Annual Meeting
San Antonio

Texas

USA (October 10 , 1979)

Publication date- Vol. 63 , Issue 9 , 1979

Pagination- Page 1600 , 1 Pages

Note- Abstract only of a paper presented at the Gulf Coast Association of Geological Societies and Gulf Coast Section, Society of Economic Paleontologist and Mineralogists, 29th annual meeting, San Antonio, Texas, October 10-12, 1979

Descriptor(s)- / Cations / Evaluation / Exploration methods / Gamma ray logging / Gamma spectroscopy / Geopressured zones / Pore pressure / Productivity / Reservoir engineering / Reservoir properties / Reservoir temperature / Salinity / Texas / Well drilling / Well logging /

Abstract by Document

Proper selection and application of properly calibrated well logs provides valuable information for exploration, drilling, and reservoir engineering. Interpretive log-derived concepts allow determination of subsurface pressure, temperature, and salinity variations, define the type of depositional environment, and evaluate the production potential of clastic and carbonate reservoir rocks. Overpressure detection and pore-pressure evaluation are of further assistance. Gamma-ray spectral-logging techniques have located permeable and/or fractured reservoir intervals in the Cretaceous carbonate trend (Austin Chalk, Eagle Ford Shale, and Buda Limestone), to determine the source-rock potential of shales, and the type of clay minerals present. A new method allows a reliable log-derived estimate of the cation exchange capacity and hence improved water saturation estimates in shaly, hydrocarbon-bearing clastic reservoir rocks.

615. GGIS-100024/B/ / 11/A/ // //

Title- Interstitial Water Composition and Geochemistry of Deep Gulf Coast Shales and Sandstones

(Paper 12 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)

Author(s)- / Schmidt , Gene W. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 11 , 1974

Pagination- Page 149 , 7 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Gulf Coast / Sedimentary rocks / Geochemistry / Pore water / Sandstone / Shale / Louisiana / Calcasieu Parish / Manchester Field / Drill cores / Density / Porosity / Clay minerals / Ion exchange / Geopressure / Fluid properties / Mechanism / Oil and gas fields / Tertiary / United States /

616. GGIS-100241/O/ / /A/ // //

Title- Introduction and Legal Overview of Geothermal Resources

Author(s)- / Root , T. E. /

Conference- Geothermal Resources Development Institute Conference

Geopressured Geothermal Bibliography

Salt Lake City
Utah
USA (January 27 , 1977)
Publisher- Rocky Mountain Mineral Law Foundation
Boulder, CO
Publication date- January 27 , 1977
Pagination- 6 Pages
Report/patent- CONF-770135--
Descriptor(s)- / Geothermal resources / Legal aspects /
Abstract by TIC
A brief introduction to the papers to follow is presented.
(MHR)

617. GGIS-100528/O/ / /A/ / / / /

Title- Introduction: the Parcperdue Test Well - DOW/D.O.E. L.R.
Sweezy No. 1
Author(s)- / Wilson , John S. /
Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)
Publication date- 1981
Pagination- Page 275 , 2 Pages
Local Availability- GGIS
Local Availability- CES
Descriptor(s)- / Data acquisition / Geopressured reservoirs / L.R.
Sweezy No. 1 Well / Louisiana / Production / Well testing /
Abstract by GGIS

The purpose of the Parc Perdue project is to determine the production characteristics of a definable geopressured water reservoir. Enough fluid will be produced over a nine month period so that the productivity curve will be completely defined. As the fluid is produced, any changes in the nature of the fluid will be recorded, and data will be collected so the economics of this type of energy production may be studied.

618. GGIS-100370/R/ / /M/ / / / /

Title- Inventory and Case Studies of Louisiana, Non-Electric
Industrial Applications of Geopressured Geothermal Resources
Subtitle- Quarterly Progress Report for Period March 1, 1977-May 31, 1977
Author(s)- / Schnadelbach , T. W., Jr. /
Publication date- June 1977
Pagination- 131 Pages
Report/patent- IDO-1629-2
Available- NTIS
(Paper Copy)
(Microfiche)
Local Availability- CES
Sponsor- / U. S. Energy Research and Development Administration
EG-77-C-07-1629 /
Auxiliary expression(s)-
Illus. / Map (17) / Diagram (4) /
Table

Descriptor(s)- / Case histories / Economics / Food processing /
Geopressure resources / Industrial plants / Louisiana / Resource
assessment / Uses /

Abstract by Author

The potential utilization of geopressured geothermal energy in the State of Louisiana as a primary source of additional energy has not yet been fully determined. The theoretical amounts of existing resource beneath the earth's surface of southern Louisiana indicate endless volumes of high pressured, hot water and more than abundant reserves of natural gas. To date, there has not been sufficient enough factual proof to stimulate the actual drilling of a bona fide geothermal well. Evidence must be provided to prospective beneficiaries that there indeed are large-enough volumes of water, at the proper temperature, within the estimated proximity, containing tolerable properties and are reasonably accessible, to attract private investment industries. It is the intent of this project to provide a quick reference source of all the above answers that will illustrate the potential resource areas within the State of Louisiana. All available data of known geopressured geothermal locations together with the theoretical high potential areas can provide much to progress the interests and the useful development of the resource. Also, it is the intent of this project to catalogue and inventory all of the industries within the State of Louisiana, classified as "Food and Kindred Products", to determine potential and specific industrial uses of the known energy resources. This will allow for the provision of technical and economic criteria for the conversion, application and transmission of energy necessary to industrial processing as a means of supplanting or reducing present energy consumption. There will also be the possibility of relocating industries to the available resources, offering the opportunity of developing geothermal energized industrial complexes. Finally, the project will provide and present individual case studies for near term industrial conversion for resource application. The case studies will illustrate the technical and economic feasibility of the non-electric industrial applications of geopressured and geothermal waters from the production well site to the disposal well, indicating the various opportunities for resource application-processing, heating, cooling, production, etc.

619. GGIS-100263/R/ / /M/ / / / /

**Title- Inventory and Case Studies of Louisiana, Non-Electric
Industrial Applications of Geopressured Geothermal Resources**

Subtitle- Final Report

Author(s)- / Arnold, Alanson J. /

Publication date- February 1978

Pagination- 358 Pages

Report/patent- IDO/1629-4

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

EF-7-C-07-1629 /

Geopressured Geothermal Bibliography

Corporate Author- de Laoreal Engineers, Inc.

New Orleans , Louisiana , USA

Auxiliary expression(s)-

Illus. / Diagram (16) / Map (19) / Graph (1) / Figure (9) /

Table

Appendix

Descriptor(s)- / Case histories / Food processing / Geopressure resources / Louisiana / Uses / Direct energy utilization / Economics /

Abstract by TIC

Vast reservoirs of geopressured geothermal energy exist in Louisiana which present opportunities for development as energy sources in the form of hydro-energy, geothermal energy, and natural gas. The hydro-energy may be harnessed within impulse turbines for mechanical drives or for electrical generation. The geothermal energy can be applied as hot water to a variety of food processing operations. Applications for the natural gas content as a fuel are obvious. The cost for development of these resources will exceed current cost experience in the development of hydrocarbon energy resources. Transmission distances for the fluid geothermal waters to points of utilization are restricted by economics. Plant thermal apparatus will be longer and more expensive than conventional equipment. In projection, the most promising non-electric application of geopressured geothermal energy to a food processing operation would first require the evaluation of a specific reservoir by drilling and testing a geopressured geothermal well to furnish energy to a plant which had been designed expressly to utilize the available energy at or near the well site.

620. GGIS-100244/R/ / /M/ / / / /

Title- Investigation and Definition of Parameters Associated with Testing Geopressured Water

Subtitle- Interim Report, Phase I Activities, June 1, 1975-- August 31, 1976

Author(s)- / Karkalits , O. C. / Hodges , J. / Jones , P. /

Publication date- 1976

Pagination- 99 Pages

Report/patent- ORO--4937-1

Corporate Author- McNeese State University

Lake Charles , Louisiana , USA

Corporate Author- Osborn-Hodges-Roberts-Wieland Engineering

Bryan , Texas , USA

Descriptor(s)- / Aquifer tests / Geopressured reservoirs / Geothermal fluids / Louisiana / Natural gas wells / Reservoir properties / Tigre Lagoon Field / Vermilion Parish / Water analysis /

Abstract by TIC

Analysis of the waters in the geopressured zone in a specific south Louisiana shut in gas well are reported. Dynamic testing of two aquifers trapped by an existing gas well in the Tigre Lagoon Field in Vermilion Parish was conducted. Information about the characteristics of the reservoir fluid and the

behavior of the reservoir under varying flow conditions was obtained.

621. GGIS-100412/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured Geothermal Wells

Subtitle- Final Report: Tenneco Fee "N" No. 1 Well, Terrebonne Parish, Louisiana

Author(s)- / Dobson , R.J. / Hartsock , J.M. / McCoy , R.L. / Rodgers , J.A. /

Publication date- September 1980

Pagination- 106 Pages

Report/patent- DOE/ET/28460-4

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy

AC08-77ET28460 /

Corporate Author- Gruy Federal, Inc.

Houston , TX , USA

Auxiliary expression(s)-

Illus. / Diagram (12) / Graph (2) / Map (4) / Table

Descriptor(s)- / Abandoned wells / Geopressured wells / Geothermal wells / Louisiana / Reentry / Tenneco Fee "N" No. 1 Well / Terrebonne Parish / Well completion / Well drilling / Wells of opportunity /

Abstract by Author

The Tenneco Fee "N" No. 1 well was originally drilled for Tenneco Exploration and Production Co. by Two-R Drilling Co. to 17,276 ft and a 4-1/2 inch liner was run to total depth. Several geothermal-geopressured sands were penetrated which met DOE selection criteria for geopressured-geothermal testing. Tenneco assisted in the preparation of the well prognosis and completion design. They also supplied on-site supervisory and operating personnel. This was the first active participation by a major oil and gas company in the well-of-opportunity program. The well was designed for higher flow rates (20,000 to 30,000 B/D), and a longer test period (60 to 90 days) than had been standard in the well-of-opportunity program. A contract with Atlantic Pacific Marine Corporation for its barge rig no. 1 was approved and the barge was moved to the location on January 9, 1980. Subsequent reentry operations could not be completed because of the difficulty of obtaining a cement seal around the 4-1/2 inch liner and because of a hole that later developed in the 4-1/2 inch liner at 13,920 ft. This breach allowed shale, gas, and salt water to enter the well bore. It was not practical to attempt further cementing operations inside the small liner to correct this condition and the decision was made to abandon. The drill barge was released April 22, 1980, after having plugged the well in accordance with state regulations. The cost of the reentry attempt was approximately \$5,250,000. Tubulars, wellhead, and test equipment having a value of approximately \$1,000,000 were

salvaged for use on future wells of opportunity. The net cost of the aborted test attempt was approximately \$4,227,000.

622. GGIS-100413/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured Geothermal Wells

Subtitle- Summary of Gruy Federal's Well-of-Opportunity Program to January 31, 1980

Publication date- March 1980

Pagination- 38 Pages

Report/patent- DOE/ET/28460-2

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of

Geothermal Energy

DE-AC0877T28460 /

Corporate Author- Gruy Federal, Inc.

Houston , TX , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (3) /

Table

Descriptor(s)- / Geopressured wells / Louisiana / Planning / Texas /

Well testing / Wells of opportunity /

Abstract by GGIS

This report updates a similar report prepared in February 1979, and provides a summary of the Well-of Opportunity Program activities. The summary includes an outline of the entire network plan, the activity and milestone history, the manpower utilization requirements, and a listing of the monthly and cumulative Well-of Opportunity candidates monitored in the program.

623. GGIS-100414/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured Geothermal Wells

Subtitle- Final Report; Beulah Simon No. 2 Well, Vermilion Parish, Louisiana. Volume II: Analytical Data

Author(s)- / Dobson , R.J. / Hartsock , J.H. / McCoy , R.L. /
Rodgers , J.A. /

Publication date- June 2 , 1980

Pagination- 165 Pages

Report/patent- DOE/ET/28460-3 (Vol. 2)

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
Geothermal Energy /

Corporate Author- Gruy Federal, Inc.

Houston , TX , USA

Auxiliary expression(s)-

Illus. / Photo (5) /

Descriptor(s)- / Beulah Simon No. 2 Well / Bottom hole pressure /
Chemical analysis / Data / Gas analysis / Geothermal brine /
Louisiana / Models / Pressure buildup / Vermilion Parish /

Abstract by GGIS

Analytical data for the Beulah Simon No. 2 Well is given in this report. Data contents include: bottomhole and surface pressure data; geothermal field test data; pressure buildup model analysis; recombination studies of produced brine; chemical analysis of brine and gas; and the chemical analyses performed by Champion Chemicals, Inc.

624. GGIS-100415/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured Geothermal Wells

Subtitle- Final Report; Fairfax Foster Sutter No. 2 Well, St. Mary Parish, Louisiana. Volume I: Completion and Testing

Author(s)- / Willits , M.H. / McCoy , R.L. / Dobson , R.J. /
Hartsock , J.H. /

Publication date- December 1 , 1979

Pagination- 116 Pages

Report/patent- DOE/ET/28460-1 (Vol. 1)

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
Geothermal Energy
DE-AC08-77ET28460 /

Corporate Author- Gruy Federal, Inc.

Houston , TX , USA

Auxiliary expression(s)-

Illus. / Diagram (6) / Figure (3) / Graph (8) / Map (5) / Photo (5) /

Table

Ref.

Descriptor(s)- / Chemical analysis / Dissolved gases / Fairfax Foster Sutter No. 2 Well / Geopressure drilling / Geopressured wells / Louisiana / St. Mary Parish / Salinity / Scaling / Solubility / Well completion / Well design / Well drilling / Well testing / Wells of opportunity /

Abstract by Author (revised)

The acquisition, completion, and testing of a geopressured-geothermal well and reservoir, part of the "Well-of-Opportunity" (WOO) Program, is covered in this report. This well, the Fairfax Foster Sutter No. 2, is the first successful test of a geopressured-geothermal aquifer in this program. Data obtained from the tests will contribute to the overall assessment of the geopressured-geothermal resource of the Upper Gulf of Mexico basin. In general, the gas solubility (22.8 scf/bbl) was as expected for the temperature, pressure and salinity of the brine. The produced water was more saline than expected (160,000 mg/l). The high concentrations of dissolved solids, coupled with the evolution of CO₂ from these waters during production, created a scaling problem in the tubular goods and surface equipment that needs to be addressed in further research.

625. GGIS-100416/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured Geothermal Wells
Subtitle- Final Report; Fairfax Foster Sutter No. 2 Well, St. Mary Parish, Louisiana. Volume II: Well Test Data
Author(s)- / Willits , M.H. / McCoy , R.L. / Dobson , R.J. / Hartsock , J.H. /
Publication date- December 2 , 1979
Pagination- 186 Pages
Report/patent- DOE/ET/28460-1 (Vol. 2)
Available- NTIS
(Paper copy)
(Microfiche)
Local Availability- GGIS
Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy
DE-AC08-77ET28460 /
Corporate Author- Gruy Federal, Inc.
Houston , TX , USA
Descriptor(s)- / Data analysis / Fairfax Foster Sutter No. 2 Well / Formation Pressure / Gas analysis / Geopressured wells / Louisiana / Mineral composition / St. Mary Parish / Water chemistry / Well data /
Abstract by GGIS

The well test data for the Fairfax Foster Sutter No. 2 Well, located in St. Mary Parish, Louisiana, is provided in this volume. Data contents include: pressure buildup data; pressure survey; geothermal field test data; analyses of reservoir brine; recombination analysis; analyses of separator gas; analyses of scale samples; H₂S in separator gas; and analysis of reservoir data.

626. GGIS-100521/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured-Geothermal Wells
(Volume I. Completion and Testing)
Subtitle- Final Report: Beulah Simon No. 2 Well, Vermilion Parish, Louisiana
Author(s)- / Dobson , R. J. / Hartsock , J. H. / McCoy , R. L. / Rodgers , J. A. /
Publication date- July 1980
Pagination- 110 Pages
Report/patent- DOE/ET/28460-3
Available- NTIS
(Paper copy)
(Microfiche)
Local Availability- CES
Sponsor- / Department of Energy, Washington, D.C. (USA)
AC08-77ET28460 /
Corporate Author- Gruy Federal, Inc.
Houston , TX , USA
Descriptor(s)- / Abandoned wells / Aquifers / Beulah Simon No. 2 Well / Brines / Data / Flow rate / Geopressured reservoirs / Geothermal brines / Louisiana / Oligocene epoch / Performance

testing / Scale monitoring / Scaling control / Testing /
 Vermilion Parish / Well drilling / Wells of opportunity /
 Wireline operation /

Abstract by NTIS

Geopressured-geothermal (Geo exp 2) test operations were conducted at the Beulah Simon No. 2 well site during the period from September through December 1979. The well provided the second geopressured-geothermal test to be completed under the DOE-Gruy Well of Opportunity program. The completion in a geopressured aquifer of Oligocene age at approximately 14,700 feet and the testing of hot salt water from this zone were accomplished without significant difficulty. Some problems were encountered with the wireline and wireline high-pressure lubricator associated with the running of bottomhole instruments. The objectives of the project were all accomplished, and good test data were obtained on the flow rates of gas and water. The gas content was 24 standard cubic feet per stock tank barrel of water. The disposal well accepted the full wellhead stream at temperatures as high as 255 exp 0 F (124 exp 0 C). Over the 10-day flow period the hot brine did not appear to adversely affect the clay minerals in the disposal aquifer. A conclusion from this operation is that presently available wirelines and pressure lubricators are not adaptable for use with uninhibited well fluids under flowing conditions. In addition, this test demonstrated that injection of scale inhibitor down the annulus eliminated scale buildup within the flow string and surface facilities.

627. GGIS-100396/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured-Geothermal Wells

Subtitle- Package No. 1 of Wells-of-Opportunity Candidates

Publication date- February 1978

Report/patent- NVO-1528-6

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

EG-77-C-08-1528 /

Corporate Author- Gruy Federal, Inc.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (5) / Map (5) / Diagram (3) /

Descriptor(s)- / Aquifers / Cameron Parish / Exploratory wells /

Geopressure exploration / Geopressured wells / Louisiana /

Reentry / Testing / Texas /

Abstract by Author

This group of wells-of-opportunity (WOO) consists of six candidates; one in Texas and five in Cameron Parish, Louisiana. Of the latter, two of three candidates in Twp 15S, Rge 5W are considered to be mutually exclusive in that each exhibits good potential for testing geopressured geothermal aquifers which are indicated to be of sufficient volume for purposes of a 30-day test well. A final selection of one location may be made from these three wells, assuming all pass screening criteria, based

Geopressured Geothermal Bibliography

on estimated cost of the test and the negotiation of a satisfactory agreement with the owners of the surface and/or the minerals.

628. GGIS-100397/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured-Geothermal Wells

Subtitle- Final Report, Gladys McCall No. 1 Well, Cameron Parish, Louisiana

Author(s)- / Dobson , R. J. / Hartsock , James H. / Willits , M. H.

/

Publication date- January 1979

Pagination- 91 Pages

Report/patent- NVO-1528-4

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Department of Energy

EG-77-C-08-1528 /

Corporate Author- Gruy Federal, Inc.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Diagram (20) /

Appendix

Descriptor(s)- / Abandoned wells / Cameron Parish / Cost / Exploratory wells / Geopressure exploration / Geopressured wells / Louisiana / Reentry / Testing /

Abstract by Author

This well, originally drilled in 1965 as Buttes Gas & Oil-Getty Oil Company No. 1 Gladys McCall, was approved for reentry and test operations after consideration of a number of reentry prospects in Cameron Parish. This was a marsh location that required 2.3 miles of board road and replacement of two bridges. Road work was commenced on June 19, 1978, and site preparation was completed on October 25. Progress Drilling Company Rig No. 21 moved on location on November 2. This rig was released on December 16. Reentry operations were completely unsuccessful because of failure to effect a tieback of the 7" casing. The plugging and abandonment records filed with the Louisiana Department of Conservation indicated that the top of the 7" casing was at or near the base of the 10 3/4" casing when the well was plugged. These records did not specify that the 7" casing had been dynamited one or more times during the recovery operation. Numerous attempts were made to locate and condition the 7" casing for tying back to the surface. All these were unsuccessful. The top of the 7" casing was never clearly located, or if located was subsequently lost, and therefore it was not possible to cut and recover the damaged section in order to effect a tieback. The total cost of the attempted reentry was approximately \$1,925,000. Of this amount, some \$444,000 was spent on road and site preparation and disposal well. This expenditure can be salvaged in the event a decision is made to redrill the well.

629. GGIS-100499/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured-Geothermal Wells

Author(s)- / Hartsock , J. H. / Rodgers , J. A. /

Publication date- September 1980

Pagination- 46 Pages

Report/patent- DOE/ET/28460-5

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-77ET28460 /

Corporate Author- Gruy Federal, Inc.

Houston , TX , USA

Descriptor(s)- / Abandoned wells / Evaluation / Exploratory wells /

Geopressured systems / Geothermal wells / Methane / Reentry /

Testing / Wells of opportunity /

Abstract by NTIS

Over the life of the project, 1143 wildcat wells were screened for possible use. Although many did not meet the program's requirement for sand development, a surprisingly large number were abandoned because of downhole mechanical problems. Only 94 of these wells were completed as commercial hydrocarbon producers. Five wells of opportunity were funded for testing. Of these, two were evaluated for their hydraulic energy, thermal energy, and recoverable methane, and three were abandoned because of mechanical problems.

630. GGIS-100500/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured-Geothermal Wells

Subtitle- Final Report

Author(s)- / Dobson , R. J. / Hartsock , J. H. / Willits , M. H. /

Publication date- January 1979

Pagination- 95 Pages

Report/patent- NVO-1528-4

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

EG-77-C-08-1528 /

Corporate Author- Gruy Federal, Inc.

Houston , TX , USA

Descriptor(s)- / Abandoned wells / Cameron Parish / Cost / Disposal

well / Drilling / Geopressured systems / Geothermal wells /

Louisiana / Reentry / Site preparation / Testing /

Abstract by NTIS

This well was approved for reentry and test operations after consideration of a number of reentry prospects in Cameron Parish. This was a marsh location that required 2.3 miles of board road and replacement of two bridges. Road work was commenced on June 19, 1978, and site preparation was completed on

Geopressured Geothermal Bibliography

October 25. The drilling rig moved on location on November 2. This rig was released on December 16. Reentry operations were completely unsuccessful because of failure to effect a tieback of the 7" casing. The plugging and abandonment records filed with the Louisiana Department of Conservation indicated that the top of the 7" casing was at or near the base of the 10-3/4" casing when the well was plugged. These records did not specify that the 7" casing had been dynamited one or more times during the recovery operation. Numerous attempts were made to locate and condition the 7" casing for tying back to the surface. All these were unsuccessful. The top of the 7" casing was never clearly located, or if located was subsequently lost, and therefore it was not possible to cut and recover the damaged section in order to effect a tieback. The total cost of the attempted reentry was approximately \$1,925,000. Of this amount, some \$444,000 was spent on road and site preparation and disposal well. This expenditure can be salvaged in the event a decision is made to redrill the well.

631. GGIS-100582/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured-Geothermal Wells
(Final Report)

Subtitle- Gladys McCall No. 1 Well, Cameron Parish, Louisiana

Author(s)- / Dobson , R.J. / Hartsock , R.J. / Willits , M.H. /

Publication date- 1979

Pagination- 90 Pages

Report/patent- NVO-1528-4

Available- NTIS

Descriptor(s)- / Cameron Parish / Evaluation / Gladys McCall No. 1
Well / Gulf Coast / Louisiana / Well testing /

632. GGIS-100347/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured-Geothermal Wells

Subtitle- Prospective Test Wells in the Texas and Louisiana Gulf
Coast

Publication date- March 1978

Pagination- 47 Pages

Report/patent- NVO-1528-2

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

EG-77-C-08-1528 /

Corporate Author- Gruy Federal, Inc.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Map (8) / Figure (4) / Diagram (4) /

Descriptor(s)- / Abandoned wells / Cost / Geology / Drilling /

Geopressure wells / Louisiana / Reentry / Texas /

Abstract by Author

This group of wells-of-opportunity (WOOs) consists of four reentry candidates located in Southern Louisiana. In addition, some preliminary information, not a part of this package but an addendum, is presented on a Galveston County well which, if dry when drilled in late summer, can be deepened to test a hot interval having unknown permeability. The four Louisiana wells have penetrated a thick section of deep hot and geopressured Miocene or Oligocene sand. Thus the geological risk is essentially eliminated. Each of these wells has been abandoned. We have placed particular emphasis on selecting wells which are reported to have been left in such a mechanical condition that the risk of reentry operations is low. Every effort will be made to further check any well chosen for unreported conditions.

633. GGIS-100394/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured-Geothermal Wells
(Final Report)

Subtitle- Final Report, Alice C. Plantation No. 2 Well, St. Mary Parish, Louisiana. Volume 1: Narrative Report

Author(s)- / Lohse , Alan / Willits , M.H. /

Publication date- December 1978

Pagination- 113 Pages

Report/patent- NVO-1528-3(Vol. 1)

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

EG-77-C-08-1528 /

Corporate Author- Gruy Federal, Inc.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (1) / Graph (3) / Map (2) / Diagram (5) /
Table

Descriptor(s)- / Abandoned wells / Cost / Disposal wells / Drilling / Geopressured wells / Louisiana / Reentry / Site selection / St. Mary Parish /

Abstract by Author

Gruy Federal, Inc. operates under contract to the Department of Energy, Division of Geothermal Energy, to evaluate potential alternate energy sources occurring within geopressured-geothermal aquifers in Miocene, Oligocene, Tuscaloosa, Wilcox, and Frio formations along the Texas and Louisiana Gulf Coast. The first well on which testing was attempted was the Alice C. Plantation No. 2 Well, located in St. Mary Parish, Louisiana. Originally drilled by the Sun Oil Company to a total depth of 19,000 feet, this well was abandoned as a dry hole in January 1964. Gruy's reentry attempt ended with plugging and abandonment after a saltwater flow on September 17, 1978. This report is a comprehensive document detailing all events and costs relating to the Alice C. Plantation well, from its initial selection as a reentry well through the plugging and abandonment operations.

634. GGIS-100395/R/ / /M/ / / / /

Title- Investigation and Evaluation of Geopressured-Geothermal Wells

Subtitle- Notes on Gruy Federal's Well-of-Opportunity Program

Publication date- February 1979

Pagination- 115 Pages

Report/patent- NVO-1528-5

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

EG-77-C-08-1528 /

Corporate Author- Gruy Federal, Inc.

Houston , Texas , USA

Auxiliary expression(s)-

Illus. / Map (2) / Figure (2) / Diagram (1) / Graph (2) /

Descriptor(s)- / Abandoned wells / Drilling / Geopressured wells / Louisiana / Research programs / Texas /

Abstract by Author

The Gruy Federal, Inc. contract to obtain geopressured geothermal test data from private industry sources became effective on September 26, 1977. The charge was to obtain test data from geopressured aquifers along the Texas and Louisiana Gulf Coast by arranging to assume operation of wells already drilled and found nonproductive of conventional oil or gas accumulations before such wells were abandoned by the operators. The program was styled "Well of Opportunity" (WOO) since advantage could be taken of expenditures which had been made already by the operator. It was proposed that upon assuming control of the well, Gruy Federal would test the geopressured aquifers after performing whatever additional operations were required, such as deepening and/or installing additional casing or wellhead systems. The major activities and important milestones accomplished are discussed in this progress report.

635. GGIS-100899/0/ / /A/ / / / /

Title- Investigation of Heat Exchanger Flow Arrangement on Performance and Cost in a Geothermal Binary Cycle

Author(s)- / Giedt , Warren H. /

Conference- 11 Intersociety Energy Conversion Engineering Conference

Pagination- Page 747 , 7 Pages

Report/patent- SAE--769130

Note- Work performed under the auspices of the U.S. Energy Research and Development Administration

Corporate Author- California Univ., Livermore

Lawrence Livermore Lab.

Livermore , California , USA

Auxiliary expression(s)-

Illus. / Diagram (3) / Graph (10) / Ref.

Descriptor(s)- / Binary cycles / Geothermal brines / Geothermal energy conversion / Heat exchangers / Performance testing / Working fluids /

Abstract by Author

The performance of an idealized geothermal binary-fluid-cycle energy conversion system is shown to be a function of the temperatures of brine and working fluid leaving the heat exchanger. System power output, heat exchanger area required and initial well and heat exchanger costs are determined for counterflow, single and multi-pass parallel-counterflow exchangers. Results are presented graphically as functions of the brine and working fluid exit temperatures from the exchanger. Use of the system analysis developed is illustrated by showing quantitatively the advantage of the counterflow over the other flow arrangements considered.

636. GGIS-100995/ / / /A/ / / / /

Title- Investigation of Heat Transfer Coefficients of Working Fluids in Geothermal Power Cycles

Author(s)- / Tleimat , B.W. / Laird , A.D.K. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 655 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- California Univ., Richmone

Sea Water Conversion Lab.

Richmond , California , USA

Auxiliary expression(s)-

Illus. / Diagram (2) /

Descriptor(s)- / Binary cycles / Geothermal energy conversion / Heat transfer / Power generation / Working fluids /

Abstract by Author

The objective of the binary fluid experiment described herein is to obtain data to determine baseline heat transfer data for working fluids being considered for binary cycle systems to produce from hot geothermal brines. These data will be used to calculate film coefficients for heating, boiling, superheating, desuperheating as well as condensation for candidate working fluids.

637. GGIS-100532/0/ / /A/ / / / /

Title- Investment and Operating Costs of Binary Cycle Geothermal Power Plants

Author(s)- / Holt , Ben / Brugman , John /

Conference- Conference on Research for the Development of Geothermal Energy Resources

Pasadena

CA (September 23 , 1974)

Geopressured Geothermal Bibliography

Publication date- December 31 , 1974

Pagination- Page 292 , 9 Pages

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (2) /

Descriptor(s)- / Binary cycle power generation / Capital / Cost /
Economics / Geothermal power plants / Hydrothermal systems /
Optimization / Production / Scaling /

Abstract by GGIS

The focus of this paper is the investment and operating cost of binary cycle geothermal power plants that use heat energy from liquid dominated reservoirs. Factors involved in optimizing plant design are discussed.

638. GGIS-100066/J/ /18301/A/ // //

Title- Iron in Shale Samples Can Mask Geopressurized Zones

Author(s)- / Brooks , Robert A. / Kovisars , Leon S. /

Journal- World Oil

Publication date- Vol. 183 , Issue 6 , July 1976

Pagination- Page 123 , 1 Pages

Note- NTIS also #3 L. 1757: (EN).

Descriptor(s)- / Oil well drilling / Blowouts / Shale / Chemical analysis /

Abstract by NTIS

High iron concentrations in shales can mask decreasing shale densities--an indication that abnormal pressure formations are being approached. However, equipment and methods are available that are fast and simple and extremely important in certain drilling areas. 3 refs.

639. GGIS-100899/O/ / /M/ // //

Title- II. Intersociety Energy Conversion Engineering Conference Proceedings

Subtitle- Volume 1

Conference- 11 Intersociety Energy Conversion Engineering Conference
State Line

Nevada

USA (September 12 , 1976)

Publication date- Vol. 1 , September 12 , 1976

Pagination- 1002 Pages

Note- Work performed under the auspices of the U.S. Energy and
Research Development Administration

Available- American Institute of Chemical Engineers

345 E. 47 Street

New York City

New York

10017

Local Availability- Eng.

Corporate Author- American Inst. of Chemical Engineers

New York

640. GGIS-100066/J/ / /A/ / / / /

Title- II. Mud Gas Logs Help Predict Occurrence of Geopressures

Author(s)- / Daw , R.N. / Myers , D.L. / Mercer , R.F. /

Publication date- Vol. 184 , Issue 4 , March 1977

Pagination- Page 61 , 4 Pages

Auxiliary expression(s)-

Illus. / Figure (8) /

Descriptor(s)- / Drilling fluids / Exploration / Geopressured systems
/ Monitoring / Well drilling /

Abstract by DOE/Recon

Careful monitoring of mud gas has proven to be invaluable for predicting the occurrence and magnitude of geopressures. Related techniques were used to determine mud weight requirements and casing setting depths for a wildcat that encountered abnormal pressures.

641. GGIS-100026/ / / /M/ / / / /

Title- Joint Southeast Southwest Regional Meeting

(Abstracts of Papers)

Publisher- American Chemical Society

Publication date- 1970

Corporate Author- American Chemical Society
Southeast-Southwest Regions

642. GGIS-100428/R/ / /M/ / / / /

Title- Klamath County Geo-Heating District Feasibility Study

Subtitle- For Klamath County Commissioners, Klamath County
Courthouse, Klamath Falls, Oregon

Author(s)- / Lienau , Paul J. / Lund , John W. / Culver , G. Gene /

Publication date- January 1977

Pagination- 142 Pages

Report/patent- 77-1

Available- Geo-Heat Utilization Center

Oregon Institute of Technology

Klamath Falls

OR

97601

(Paper copy)

Local Availability- CES

Corporate Author- Oregon Inst. of Tech.

Geo-Heat Utilization Center

Klamath Falls , USA

Auxiliary expression(s)-

Illus. / Diagram (47) / Photo (23) / Graph (24) / Map (3) /

Table

Ref.

Descriptor(s)- / Cost / Design / District heating / Economic analysis
/ Environmental impacts / Equipment / Feasibility studies /

Geothermal space heating / Geothermal wells / Installation /
Klamath Falls KGRA / Pipes / Planning / Public buildings / Pumps
/ Specifications /

Abstract by Author (rev.)

This project was principally aimed at supplying geothermal heat to ten city and county buildings by hot water extracted from the existing museum well. The supply system is also designed to include the post office and a new building to be built in the vicinity of the courthouse. The fluid would be piped from the museum well to three liquid to liquid heat exchangers and returned to the area of the producing well for reinjection into the same aquifer. The study also considered space heating of 98 additional buildings in the downtown business district equivalent to the ten public buildings and incorporating a snow removal grid on Main Street between Eleventh and Fourth Streets. The geothermal fluid would be supplied from wells in the vicinity of Old Fort Road (city police pistol range) and returned for reinjection. Based on the study, the Center has concluded that no major resource or engineering difficulties exist that would prevent the ten-building project from being completed successfully with a significant long-term savings in both scarce fossil fuels and total heating costs. A direct environmental benefit of the large scale plan would be a significant reduction in air pollutants (16 tons per year) from the burning of natural gas. For a capital investment of approximately \$548,900 the delivery system, conversion of building heating systems and waste disposal could be accomplished for the ten buildings with potential expansion to twelve. On an annual basis, operation, maintenance repair and interest on a 25-year retirement would be \$54,240 per year. This compares with an estimated 1976 annual natural gas heating cost of \$69,300 or fuel oil heating cost of \$94,900. If the 12-building plan were fully implemented, it will: (1) Provide heat equivalent to approximately 159 average homes; (2) Save 275,900 therms (27.6 million ft³) of natural gas, or 207,000 gallons of fuel oil per year; (3) Provide the equivalent capacity of a 4.1 MW electric power plant. If the 110-building plan were fully implemented, it will: (1) Provide heat equivalent to approximately 1,140 average homes; (2) Save 1,970,000 therms (197 million ft³) of natural gas or 1,478,000 gallons of fuel oil per year; (3) Provide the equivalent capacity of a 29.3 MW electric power plant. It is recommended the county and city proceed with the proposed project.

643. GGIS-100528/0/ / /A/ / / / /

Title- Laboratory Determination of Mechanical Properties of Rocks
from the Parcedue Geopressured/Geothermal Site

(Addendum)

Author(s)- / Sinha , Krishna P. / Borschel , Thomas F. / Holland ,
Michael T. / Schatz , John F. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (
October 13 , 1981)

Publication date- 1981

Pagination- 9 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-79ET-27255 /

Auxiliary expression(s)-

Illus. / Figure (3) / Graph (4) /

Table

Ref.

Descriptor(s)- / Fluid flow / L.R. Sweezy No. 1 Well / Laboratory studies / Rock deformation / Rock fluid interactions / Testing /

Abstract by GGIS

Test results provide information on mechanical properties and deformational characteristics of core samples from DOW-DOE L.R. SWEEZY NO.1 TEST WELL at the Parcperdue Geopressed/Geothermal Site. Sandstone and shale samples from different depths have been studied for elastic moduli, compressibility, uniaxial compaction coefficient, strength, creep parameters, permeability, acoustic velocities, and the changes with simulated reservoir production. Tests were designed to calculate several of these parameters in a single test and consisted of several hydrostatic and triaxial loading phases and pore pressure reduction. In some phases pore volume changes were measured.

644. GGIS-100345/R/ / /M/ / / / /

Title- Lawrence Livermore Laboratory Geothermal Energy Program

Subtitle- A Status Report on the Development of the Total-Flow Concept

Author(s)- / Austin, A.L. / Lundberg, A.W. /

Publication date- November 2, 1978

Pagination- 77 Pages

Report/patent- UCRL-50046-77

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U.S. Department of Energy

W-7405-ENG-48 /

Corporate Author- California Univ., Livermore

Lawrence Livermore Lab

Livermore, California, USA

Descriptor(s)- / Electric power / Geopressure resources / Geothermal energy conversion / Performance testing / Power generation / Technology assessment / Total flow systems / Turbines / Economics / Efficiency / Geopressed systems / Hot water systems / Nozzles / Two phase flow /

Abstract by TIC

The technology development activities of the Geothermal Energy Program at the Lawrence Livermore Laboratory are summarized. Significant progress toward development of the Total-flow concept was made during FY 1978. The results show that the original goal of 70% engine efficiency for the Total-Flow impulse turbine is achievable, that a Total-Flow system is competitive economically with conventional systems, and that the Total-Flow concept offers the benefit of more efficient utilization of geothermal resources for electric power production. The evaluation of several liquid expanders designed for low-temperature (including geopressed) resources suggests

that if development were continued, these expanders could be used in combination with conventional systems to increase overall system efficiency. Although the program was terminated before complete field testing of prototype systems could be carried out, the concepts have been adopted in other countries (Japan and Mexico), where development is continuing.

645. GGIS-100008/O/ / 1/A/ / / / /

Title- Lawrence Livermore Laboratory Geothermal Projects

Author(s)- / Austin, A. L. /

Conference- Geothermal Power Development

Publication date- June 18, 1974

Pagination- Page 15, 11 Pages

Report/patent- LBL--3099

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Descriptor(s)- / Binary fluid systems / Brines / Design / Geopressured systems / Geothermal energy conversion / Geothermal power plants / Lawrence Livermore Laboratory / Pilot plants / Planning / Research programs / Total flow systems /

Abstract by ERDA/RECON

The LLL Geothermal Development Project emphasizes the development of methods for recovery and conversion of the energy of high temperature, high salinity brines. Construction and operation of a small (.10 MW(SUB E)) field experimental power plant is planned to demonstrate technical and economical feasibility of the concepts, and to provide a continuing source of operating data useful for design of larger commercial size systems. The binary cycle system and the total flow system are currently under development. A program for recovery and utilization of geopressured resources is also under development. (LBS)

646. GGIS-100532/O/ / /A/ / / / /

Title- Leasing of Federal Geothermal Resources

Author(s)- / Stone, Reid T. /

Conference- Conference on Research for the Development of Geothermal Energy Resources

Pasadena

CA (September 23, 1974)

Publication date- December 31, 1974

Pagination- 6 Pages

Local Availability- GGIS

Corporate Author- Geological Survey

Menlo Park, CA, USA

Descriptor(s)- / Environmental impacts / Geothermal resources / KGRAs / Leasing / Legal aspects / Regulations /

Abstract by GGIS

The interrelationships among the Department of the Interior, the Geological Survey, and the Bureau of Land Management as

pertaining to the federal geothermal competitive leasing program are discussed, as are the procedures of the geothermal leasing program.

647. GGIS-100411/O/ / 1/A/ / / / /

Title- Legal and Environment Aspects

(5. Session)

Author(s)- / Vanston , John H. /

Conference- 2nd Geopressed Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 303 , 32 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

648. GGIS-100425/R/ / /M/ / / / /

**Title- Legal and Institutional Impediments to Geothermal Energy
Resource Development-- A Bibliography**

Publication date- January 1978

Pagination- 46 Pages

Report/patent- TID-3365

Available- Technical Information Center

P.O. Box 62

Oak Ridge

TN

37830

(Paper copy)

Local Availability- CES

Corporate Author- Department of Energy

Technical Information Center

Oak Ridge , TX , USA

Descriptor(s)- / Communities / Constraints / Development / Energy
policy / Environmental policy / Geothermal resources /
Institutional aspects / Laws / Leasing / Legal aspects /
Regulations / Taxes /

Abstract by Author

This bibliography contains 485 references to literature on the subject of legal and institutional constraints to the development and use of geothermal energy resources. In addition to government-sponsored reports, journal articles, and books, the bibliography includes specific state and Federal laws and regulation, court cases of interest, and conference proceedings. References are arranged in inverse chronological order and are made up of complete bibliographic citations. These are followed by an abstract or a listing of subject descriptors used to describe the subject content of each reference. Four indexes are provided: Corporate, Personal Author, Subject, and Report Number. Each index is introduced by text that describes its

Geopressured Geothermal Bibliography

content and format. The citations in this bibliography are also included in DOE's Energy Data Base, and may be recalled using DOE's on-line computer retrieval system RECON.

649. GGIS-100411/O/ / 1/A/ / / / /

Title- Legal Aspects of Utilizing Geopressured Water as a Source of Energy

Author(s)- / Hardy , George /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 305 , 5 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Auxiliary expression(s)-

Discuss.

650. GGIS-100528/O/ / /A/ / / / /

Title- Legal Impediments to Geopressured Development

Subtitle- Current Concerns

Author(s)- / Harrell , Thomas A. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 49 , 3 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Energy source development / Geopressure resources / Ground subsidence / Leasing / Legal aspects / Louisiana / Mineral rights / Ownership /

Abstract by GGIS

Several legal problems threaten to impede geopressured geothermal resource development. The question of mineral ownership of geopressured geothermal resources in Louisiana is probed through discussion of the impact the recent opinion of the Louisiana Supreme Court in the case of Continental, Inc. vs. Allison (Docket 67,188, June 22, 1981) could have with regards to the Louisiana Mineral Code (effective July 1, 1975). Legal responsibility for subsidence that may occur on lands adjacent to those on which a geopressured geothermal resource is being developed is addressed. Leasing issues are also discussed.

651. GGIS-100042/J/ / 409/A/ / / / /

Title- Legal Issues in the Development of Geopressured Geothermal Resources of Texas and Louisiana Gulf Coast

Author(s)- / Elmer, Donald B. /

Journal- Geothermal Energy Magazine

Publication date- Vol. 4, Issue 9, February 1976

Pagination- Page 13, 19 Pages

Note- Continuance Pagination: 13(3), 22(4), 27(12)

Descriptor(s)- / Geothermal energy / Legislation /

Abstract by NTIS

This report is divided into two major sections, legal scholarship and legal support. Scholarship is distinguished from support by concentration on abstract analyses of issues which include resource definition, ownership, taxation, and multistate reservoirs. Support is based entirely on those legal tasks called up by the technical work scheduled in the areas of resource assessment, advanced research and technology, institutional and environmental and resource utilization. The thirteen western states, Texas and Louisiana, and the United States all have statutes which deal with geothermal resources in various manners. The scope of many of these legislative provisions is limited to leases of state-owned lands and regulation of operation of wells and facilities on all lands. Few of the statutes define the resource so as to include all types of geothermal resource, with hot rock massifs and geopressured systems being most commonly left out. Few of the statutes define the resource so as to include the entire system as set out in the physical model.

652. GGIS-100363/R/ / /M/ / / / /

Title- Legal Issues Related to Geopressured-Geothermal Resource Development

(Geopressured-Geothermal Technical Paper No. 1)

Publication date- July 1979

Pagination- 49 Pages

Report/patent- DOE/ET/28464-(vol. 1)

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Department of Energy

ET-78-G-05-5958 /

Corporate Author- RPC, Inc.

Austin, Texas, USA

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Commercialization / Energy source development / Electric power / Energy policy / Geopressure resources / Ground subsidence / Legal aspects / Liabilities / Rates / Regulations / Taxes / Texas / Waste disposal /

Abstract by Author

This paper discusses the legal aspects of geopressured geothermal development in Texas. Many of the legal issues associated with geopressured geothermal development in Texas are unsettled and represent areas of developing policy and law.

Lawsuits can be expected either before or shortly after the first commercial development of geopressured geothermal resources.

653. GGIS-100411/O/ / 2/A/ / / / /

Title- Legal, Institutional, and Environmental
(5. Volume)

Author(s)- / Vanston , John H. / Elmer , Donald B. / Gustavson , Thomas C. / Kreitler , Charles G. / Letlow , Kathlene / Lopreato , Sally Cook / Meriwether , Marian / Ramsey , Paula / Rogers , Kathryn E. / Williamson , James K. /

Conference- 2nd Geopressured Geothermal Energy Conference
Austin
Texas
USA

Publication date- Vol. 2 , February 25 , 1976

Pagination- 420 Pages

Auxiliary expression(s)-

Illus. / Diagram (7) / Graph (7) / Map (33) /

Ref.

Tables

Descriptor(s)- / Geothermal energy / Geo brine / Federal law / State and local law / Texas / Gulf of Mexico / Federal taxation / State and local taxation / Environmental impact assessment / Land subsidence / Water pollution / Geothermal drilling / State public lands / Proceedings / Litigation / Economics / Land use / Legal aspects / Arizona / California / Idaho / Louisiana / New Mexico / Nevada / Alaska / Colorado / Hawaii / Montana / Oregon / Geopressured systems / Utah / Washington / Maps / Tables / Environmental effects / Diagrams / Temperature / Measurement / Taxes / Regulations / Data / Waste disposal / Geological setting / Flow rate / Chemical composition / Subsidence / Faults / Salinity /

Abstract by Energyline

Legal, environment, socioeconomic, demographic, and political factors in the development of geopressured geothermal resources off the U.S. Gulf Coast are analyzed. Legal issues include resource definition, ownership, taxation, and multistate reservoirs. The physical model of the geopressured geothermal resource is compared with the model articulated in statutes and case law. Few statutes include all types of geothermal resource in definition. Geothermal fluid disposal, particularly of hot saline water, potential land subsidence, and possible activation of faults are major environmental concerns. Baseline social, political, and demographic data are presented, and the local socioeconomic impacts of drilling, development, and production are assessed. (7 diagrams, 17 graphs, 33 maps 468 references, 14 tables)

654. GGIS-100136/R/ / /M/ / / / /

Title- Lineations and Faults in the Texas Coastal Zone

Subtitle- Report of Investigations No. 85

Author(s)- / Kreitler , Charles W. /

Publication date- 1976
 Pagination- 34 Pages
 Report/patent- RI-85
 Available- Bureau of Economic Geology
 University Station
 Box X
 Austin, Texas
 78712)
 Corporate Author- Texas University, Austin
 Bureau of Economic Geology
 Austin, Texas, USA
 Auxiliary expression(s)-
 Illus. / Diagram (3) / Graph (11) / Map (9) / Photo (3) /
 Ref.
 Descriptor(s)- / Fault activation / Faults / Fluid withdrawal / Ground
 subsidence / Gulf Coast / Lineations / Texas /
 Abstract by Author

Over 7,000 miles of lineations have been observed on aerial photographic mosaics of the Texas Coastal Zone. These lineations, in part, represent the surface traces of faults originating in the Tertiary sediments and propagating through the Quaternary sediments. The extrapolation of subsurface faults from specific oil and gas reservoirs are commonly coincident to lineations in those areas. Some extrapolated fault traces weave back and forth across lineations for 10 to 20 miles and then coincide with another lineation and follow it for 20 miles. They also may partially represent fracture-joint systems within the sedimentary deposits of the Gulf Basin. In the Houston-Galveston area of land subsidence, lineations commonly correspond with zones of active faulting. Coincidence of lineations and active faults occurs along the Hockley escarpment and in the complexly faulted Ellington Air Force Base-NASA area. Many lineations coincide with zones of differential subsidence; fifty percent of intersections of subsidence profiles and lineations occur at points of differential subsidence. Differential subsidence may be a precursor to active faulting; the land surface flexes before fault displacement is evident. With increased regional subsidence, active surface faults may be expected to develop within zones of differential subsidence. Movement on faults in the Houston area is being activated and accelerated by ground-water withdrawal. The rate of fault movement on the Long Point Fault and Eureka Heights Fault increases and decreases as the piezometric surface rises and declines, respectively. Land subsidence and fault activation can be expected in areas of the Texas Coastal zone other than the Houston-Galveston area if in these areas there is extensive ground-water withdrawal from shallow (less than 3,000 FT) fresh-water artesian aquifers. In these areas surface faulting and/or differential subsidence would be expected to occur in part within the zones defined by the lineations.

 655. GGIS-100999/0/ / /A/ / / / /

Title- Liquid-Fluidized-Bed Heat Exchanger Flow Distribution Models

Geopressured Geothermal Bibliography

Author(s)- / Cole , L.T. / Allen , C.A. /
Conference- 13th Intersociety Energy Conversion Engineering
Conference

Pagination- Page 1129 , 6 Pages

Report/patent- SAE--789316

Corporate Author- Allied Chemical Corp.

Idaho Falls , Idaho , USA

Auxiliary expression(s)-

Illus. / Diagram (4) / Graph (2) /

Ref.

Descriptor(s)- / Flow Models / Fluidized bed heat exchangers /
Geothermal brines / Heat transfer / Performance testing /
Scaling control /

Abstract by Author

Allied Chemical Corporation at the Idaho National Engineering Laboratory is developing liquid-fluidized-bed shell-and-tube heat exchangers for geothermal applications. Sand fluidized by geothermal water on the shell-side prevents scaling and increases heat transfer coefficients over conventional heat exchangers. Tests were conducted on two instrumented fluidized-bed exchanger models, constructed primarily of plexiglass, which differ in tube bundle orientation. One contains a horizontal bundle and the other a vertical tube bundle. The vertical model proved to have more uniform flow distribution and higher heat transfer coefficients than the horizontal model. The horizontal heat exchanger experienced piling on top of the tubes and "dead" areas in the bed. New design concepts for both vertical and horizontal assemblies were developed and recommendations for further developmental work are presented.

656: GGIS-100999/0/ / /A/ / / / /

Title- Liquid-Fluidized-Bed Heat Exchanger Scale Control and Corrosion Tests

Author(s)- / Allen , C.A. / McAtee , R.E. / Grimmer , E.S. /
Conference- 13th Intersociety Energy Conversion Engineering
Conference

Pagination- Page 1109 , 5 Pages

Report/patent- SAE--789312

Corporate Author- Allied Chemical Corp.

Idaho Falls , Idaho , USA

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (2) / Photo (1) /

Table

Ref.

Descriptor(s)- / Corrosion / Corrosion resistance / Geothermal brines
/ Heat exchangers / Heat transfer / Scaling control / Testing /

Abstract by Author

Tests of a liquid-fluidized-bed heat exchanger in a horizontal configuration were conducted at the Department of Energy (DOE) Geothermal Components Testing Facility (GCTF) to study scale control on the heat transfer surfaces. No scale appeared on the bedside of the heat exchanger tubes. Scale did deposit above the bed and muscovite crystals were found in the silica sand bed material. Heat transfer data from this experiment correlated

with theoretical calculations derived from Raft River experiments. Corrosion, scaling, and erosion of candidate construction materials showed the weight loss of 1025 carbon steel to be 314.4 $\mu\text{m}/\text{yr}$. Harder alloys such as Hastelloy G, Hastelloy C-276, SS 340L, SS 316, SS 347, and Nitronic 50 had weight losses of less than 1.0 $\mu\text{m}/\text{yr}$. Heat transfer data and observations from this experiment will be used to design liquid-fluidized-bed heat exchangers for electric and non-electric applications.

657. GGIS-100308/0/ / /A/ // //

Title- Liquid-Fluidized-Bed Heat Exchangers for a 50-MW Plant
Author(s)- / Allen , C.A. / Lawford , T.W. / Van Haaften , D.H. /
Conference- Geothermal Resources Council 2nd Annual Meeting
 Hilo
 Hawaii
 USA (July 25 , 1978)
Publisher- Geothermal Resources Council
 Davis, California
Publication date- Vol. 2 , Issue 1 , 1978
Pagination- Page 5 , 5 Pages
Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 California
 95616
Local Availability- CES
Corporate Author- Idaho National Engineering Lab.
 Idaho Falls , Idaho , USA
Auxiliary expression(s)-
 Illus. / Diagram (2) /
 Table
Descriptor(s)- / Fouling / Geothermal brines / Heat exchangers /
 Scaling control / Thermal efficiency /
Abstract by Author
 Liquid-fluidized-bed and conventional heat exchangers were sized for a 50-MW dual boiling plant for the Raft River resource. Thermal performance was calculated for low and high-pressure preheaters, low and high-pressure boilers, and condensers. A plant using liquid-fluidized-bed exchangers requires 56 percent of the heat-transfer surface area compared to a plant with conventional tube-and-shell exchangers. Shell volume is greater for fluidized-bed exchangers; however, increased shell cost is partially offset by the lower design pressure achieved by putting the geothermal fluid on the shell side. With the working fluid on the tube side, the isobutane inventory in the exchangers is reduced by 45 percent. Parasitic pumping costs due to pressure drops are the same for both systems within the accuracy of calculation.

658. GGIS-100308/0/ / /A/ // //

Title- Local Government Management of Geothermal Resources

Geopressured Geothermal Bibliography

Author(s)- / Anglin , Richard L. , Jr. /
Conference- Geothermal Resources Council 2nd Annual Meeting
Hilo
Hawaii
USA (July 25 , 1978)
Publisher- Geothermal Resources Council
Davis, California
Publication date- Vol. 2 , Issue 1 , 1978
Pagination- 4 Pages
Available- Geothermal Resources Council
P.O. Box 98
Davis
California
95616
Local Availability- CES
Auxiliary expression(s)-
Illus. / Figure (1) /
Ref.
Descriptor(s)- / Geothermal industry / Geothermal resources / Legal
aspects / Local government / Regulations /
Abstract by Author
Potential policy options for regulation of geothermal resources
by local government may be conceptualized along a continuum from
no regulation to total regulation of the industry. The practical
lower limit is regulation of nuisance impacts such as pollutant
emissions, noise, and the like. Options along the regulatory
continuum may be grouped roughly into two categories based on the
information required to regulate surface manifestations of
geothermal development versus that required to control the
resource itself. Management scenarios controlling the resource
itself from the practical upper limit on local government
regulation of geothermal resources. Local government must
carefully balance the benefits to be derived from seeking to
control the resource itself against the costs of that
regulation. It is not clear that local government should or can
impose regulations on use of the resource itself.

659. GGIS-100528/O/ / /A/ / / / /

Title- Location and Evaluation of Reservoirs Containing Solution Gas
and Free Gas
Subtitle- Texas Gulf Coast
Author(s)- / Gregory , A.R. / Jirik , L.A. / Reed , R.S. / Weise ,
B.R. / Morton , R.A. /
Conference- Fifth Conference on Geopressured-Geothermal Energy (
October 13 , 1981)
Publication date- 1981
Pagination- Page 255 , 3 Pages
Local Availability- GGIS
Local Availability- CES
Sponsor- / Gas Research Inst., Chicago, IL (USA)
5087-321-0398 /
Auxiliary expression(s)-
Illus. / Figure (1) / Map (2) /
Table
Ref.

Descriptor(s)- / Aquifers / Dissolved gases / Evaluation /
Geopressure / Gulf Coast / Hydropressure / Recommendations /
Site selection / Texas /

Abstract by Author

This report describes the first phase of a project designed to locate and evaluate a test-well site in a prospective watered-out gas reservoir in the Texas Gulf Coast area. The prospective reservoir may be geopressed or hydro pressured and should be suitable for application of secondary gas recovery methods for producing unconventional gas after primary production ceases. Unconventional gas consists of solution gas, immobile dispersed gas in the watered-out zone, and mobile gas present in thin non-commercial stringer sands. The test well should produce at a gas/brine ratio that exceeds the solution gas/brine ratio in order to improve economic viability. The first phase of the project consisted of establishing guidelines for screening and selecting a favorable prospect from a large number of gas reservoirs that are partly or completely watered out. The Port Arthur Field, Jefferson County, Texas, was selected because it contains multiple watered-out gas sandstones, multiple thick aquifers, and gas stringer sandstones in the lower Hackberry (Frio) sandstone interval at depths from 10,850 to 11,700 ft. Some of the Hackberry reservoirs are laterally extensive and have excellent reservoir characteristics. Future work will concentrate on detailed studies of these reservoirs to determine gas and aquifer volumes, producibility, and economic potential. A test-well site will be delineated.

660. GGIS-100533/0/ / /A/ / / / /

Title- Log Interpretation Techniques to Identify Production Zones in Geothermal Wells

Author(s)- / Mathews , Mark /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 303 , 7 Pages

Local Availability- GGIS

Corporate Author- Los Alamos Scientific Lab.
NM , USA

Auxiliary expression(s)-

Illus. / Figure (2) /
Ref.

Descriptor(s)- / Cuttings / Fault zones / Formation damage / Fracture properties / Fractured reservoirs / Fractures / Geologic structures / Geophysical surveys / Geothermal wells / Mechanical properties / Reservoir description / Thermal exploration methods / Well information systems / Well logging / Wireline operation /

Abstract by GGIS

Described are interpretation techniques using wireline logs and drill cuttings to detect fracture zones, both open and closed, in geothermal wells. This information provides a better

Geopressured Geothermal Bibliography

estimate of reservoir size, flow control, and production potential.

661. GGIS-100560/R/ / /M/ / / / /

Title- Long Range Assessment of R and D Policy for Gas-Related Conversion Technologies and Unconventional Natural Gas Resources

Author(s)- / Kydes , A.S. / Rabinowitz , J. /

Publication date- April 25 , 1980

Pagination- 134 Pages

Report/patent- BNL-51208

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC02-76CH00016 /

Corporate Author- Brookhaven National Lab.

Upton , NY , USA

Descriptor(s)- / Commercialization / Economics / Energy conversion /
Energy policy / Gases / Planning / Research programs /
Socio-economic factors /

Abstract by NTIS

This study analyzes the energy impacts on the U.S. energy-economy system on a set of successful R and D programs. These programs are presumed to have led to the commercialization of innovative technologies that increase the U.S. gaseous fuels resource base and promote the development of advanced natural gas conversion technologies for residential/commercial uses. The GRI and its principal subcontractor, TRW Incorporated, provided the detailed specifications of the energy conditions for both a Base Case and an R and D Policy Case. These conditions can be broadly categorized in terms of key energy resource price assumptions, energy resource availabilities, technology characterizations and market penetration guidelines for all energy technologies. Dale W. Jorgenson Associates (DJA) developed a set of demographic and economic projections including population, employment, and real GNP growth rates. The GRI and TRW staff provided the technology characterizations for most of the gas-related technologies and a number of other technologies. The data for the remaining technology characterizations were taken, for the most part, from Bhagat et al. This report presents the energy results from the BNL/DJA energy-economy system as executed under GRI specifications. It is intended to serve as a complement to the DJA report on the macro-economic consequences of these specifications. Certain assumptions incorporated in the R&D and Base scenarios relating to market penetration were identified as particularly sensitive. In light of the uncertainty inherent in them, an additional set of sensitivity runs were requested by GRI and are presented in Appendix B.

662. GGIS-100217/J/ / /A/ / / / /

Title- Louisiana Geopressured Well

Journal- Inf. ERDA Wkly. Announce.

Publication date- Vol. 3 , Issue 25 , 1977
 Pagination- Page 3
 Descriptor(s)- / Geothermal prospecting / Thermal springs / Louisiana
 / Geopressure exploration / Geopressured wells /
 Abstract by ERDA

Researchers working on an abandoned gas well in Louisiana have found significant quantities of natural gas mixed with hot, high-pressure water trapped two miles underground. The well, located in Vermilion Parish, about 25 miles south of Lafayette, Louisiana, produced up to 10,000 barrels of salty water per day containing dissolved natural gas. Initially, natural gas was recovered at rates exceeding 1.5 million cubic feet per day, indicating that some undissolved natural gas was being recovered in addition to the dissolved geopressurized natural gas. Towards the end of the flow test, when the water production rate was reduced to 3000 barrels per day, gas production stabilized at about 200,000 cubic feet per day, or about 70 cubic feet per barrel of fluid.

 663. GGIS-100084/R/ / /M/ / / / /

Title- LLL Geothermal Energy Development Program
 (Impulse Turbines, Total Flow Conversion System)

Subtitle- Status Report, January 1974--January 1975

Author(s)- / Austin , A. L. /

Publication date- February 14 , 1975

Report/patent- UCID--16721

Available- NTIS

(Paper copy)

(Microform)

Corporate Author- California Univ.

Lawrence Livermore Laboratories

Livermore , California , USA

Descriptor(s)- / Brines / Chemical composition / Corrosion / Design /
 Gas analysis / Geochemistry / Geopressured systems / Geothermal
 energy conversion / Geothermal resources / Hot water systems /
 Materials testing / Nozzles / Precipitation / Research programs /
 / Salton Sea / Scaling / Turbines / Two-phase flow /

 664. GGIS-100407/O/ / /A/ / / / /

Title- Marketing Geothermal Energy for Space Conditioning

Author(s)- / Atkinson , David J. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal
 Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 545 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasei W. Roberts

Geopressured Geothermal Bibliography

Available- Geothermal Resources Council
P.O. Box 98
Davis
CA
95616

Local Availability- GGIS

Descriptor(s)- / Air conditioning / Charges / Commercial buildings / Commercialization / Comparative evaluations / Contracts / District cooling / District heating / Geothermal industry / Legal aspects / Market / Nevada / Public opinion / Public relations / Residential buildings / Space heating / Trade /

Abstract by GGIS

As geothermal resources are commercialized, suppliers of this resource will compete directly with conventional fuel source suppliers. In order for geothermal energy to capture part of the market, specific marketing strategies will be needed. In this report, marketing of space conditioning to the commercial and residential sectors is discussed, with special attention given to: legal and negotiating problems; heat sale agreements; and pricing considerations. In addition to identifying the typical consumer's fears and concerns regarding geothermal energy use, the report offers some solutions to the problem.

665. GGIS-100444/R/ / /M/ / / / /

Title- Materials Research and Evaluation for Geothermal Corrosion Environments

Subtitle- Progress Report for Period December 15, 1975 -- December 15, 1976

Author(s)- / Troiano , A. R. / Hehemann , R. F. /

Publication date- December 1976

Pagination- 39 Pages

Report/patent- COO-2602-4

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Energy Research and Development Administration,
Washington, D.C. (USA). Div. of Geothermal Energy
EY-76-S-02-2602 /

Corporate Author- Case Western Reserve Univ.

Dept. of Metallurgy and Materials Science

Cleveland , OH , USA

Auxiliary expression(s)-

Illus. / Photo (2) /

Table

Ref.

Descriptor(s)- / Anistropy / Brittleness / Comparative evaluation / Corrosion resistant alloys / Experimental results / Geothermal brines / Hydrogen sulfides / Laboratory testing / Materials testing / Salinity / Stress corrosion /

Abstract by Author

In terms of stress corrosion cracking resistance in sour brines, a recently developed modified 4135 steel has exhibited a design yield strength advantage of approximately 10,000 psi over the standard 4130 (Y.S. approximately 110,000 psi) widely

employed for casing, production tubing, etc. For a specified strength level, resistance to SCC is improved by higher tempering temperatures in heat treating, giving rise to an approach to new alloy design for constructional type steels. Preliminary results indicate that improvements over the modified 4135 can be achieved. Increasing test temperature reduces the susceptibility to SCC in the constructional steels thus moderately raising the useful strength level; but immunity cannot be achieved. On the other hand, susceptibility of the highly alloyed materials increases with increasing temperature, at least up to 425 deg F. Increasing salt concentration from 5%-20% did not appear to increase susceptibility to SCC. An age hardenable austenitic alloy, A-286, is susceptible to SCC in the fully aged condition (190 KSI) at 325 deg F and 425 deg F. Susceptibility is greatly reduced by over-ageing to a still respectable strength level of 155 KSI.

666. GGIS-100532/O/ / /A/ / / / /

Title- Measuring Ground Movement in Geothermal Areas of Imperial Valley, California

Author(s)- / Lofgren, Ben E. /

Conference- Conference on Research for the Development of Geothermal Energy Resources
Pasadena

CA (September 23 , 1974)

Publication date- December 31 , 1974

Pagination- Page 128 , 6 Pages

Local Availability- GGIS

Corporate Author- Geological Survey
Sacramento , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Map (6) /

Descriptor(s)- / California / Energy source development / Geothermal systems / Ground subsidence / Imperial Valley / Monitoring / Salton Sea /

Abstract by Author

Significant ground movement may accompany the extraction of large quantities of fluids from the subsurface. In Imperial Valley, California, one of the potential hazards of geothermal development is the threat of both subsidence and horizontal movement of the land surface. Regional and local survey nets are being monitored to detect and measure possible ground movement caused by future geothermal developments. Precise measurement of surface and subsurface changes will be required to differentiate man-induced changes from natural processes in this tectonically active region.

667. GGIS-100021/J/ / 601/A/ / / / /

Title- Mechanism of Ocean-Floor Spreading as Disclosed by High Pressure Experiments

Original Title- Mechanismus des "Oceanic Spreading" in Lichte Von Hochdruck Experimenten

Geopressured Geothermal Bibliography

Author(s)- / Szadecky-Kardoss , E. /
Journal- Acta. Geod. Geophys. Montan.
Publication date- Vol. 6 , Issue 1 , 1971
Pagination- Page 203 , 19 Pages
Language- German
Auxiliary expression(s)-

Sum.

Illus.

Descriptor(s)- / Tectonophysics / Sea-floor spreading / Geosynclines
/ Plate tectonics / Mechanism / Evolution / Movement / Origin /
Causes / Experimental studies / Models / Argillaceous rocks / P-T
conditions / Lithosphere / Crust / Upper mantle / Isostasy /
Sediments / Geopressure / Tectonics / Magmas / Benioff zones /

668. GGIS-100058/J/ / /A/ / / /

Title- Methane from Geopressured Aquifers Studied

Author(s)- / Doscher , T.M. / Osborne , R.H. / Rhee , S.W. / Wilson
/ T. / Cox , D. /

Publication date- Vol. 77 , Issue 15 , April 9 , 1979

Pagination- Page 178 , 3 Pages

Corporate Author- University of Southern California
Los Angeles , California , USA

Auxiliary expression(s)-

Illus. / Graph (4) /

Table

Ref.

Descriptor(s)- / Aquifers / Cost / Economics / Gas production /
Geopressured reservoirs / Gulf Coast / Methane / Reservoir
properties / Texas /

Abstract by Author (rev.)

The economics of methane production from Texas geopressured aquifers is assessed. For a realistic expectation of reservoir size (a reservoir volume of 0.06 cu mile) a sustained production rate of less than 5,000 psi could be expected. Further, such a reservoir containing 226,000 bw/acre would show a recovery of only 6% when drilled on 640-acre spacing, decreasing to 2% if drilled on 40,000-acre spacing. The cost of the produced gas, assuming 100% recovery of the gas in the brine, was calculated using a 15% return on investment. The investment in a single well complex was estimated at \$5,145,000. The total operating costs per 1,000 bbl of brine was comprised of three unit costs; \$.10 for the operation and overhead of the producing well; \$.20 for the operation of the stripping facility, the disposal pumps, and well; and \$(0.50)(P)(Gas cost/MMBTU) for the energy to dispose of the water. No allowance was made for substantial workovers of the wells, stabilization, and filtration of the brine. The overall results of the cost calculations indicate that the cost of methane recovered from geopressured aquifers could be brought down to \$4/Mscf only if reservoir volume were in excess of 1 cu mile and the optimistic estimates of operating costs prevailed. For the more likely reservoir volumes, the costs would be in excess of \$10/Mscf. Considering that these calculations are based on a 15% rate of return, include no predevelopment costs, and no land costs, it does not appear that methane recovered from geopressured aquifers can be a

competitive supply of energy in the United States for many generations to come.

669. GGIS-100513/R/ / /M/ / / / /

Title- Methane Entrained in Geopressured Aquifers, Texas Gulf Coast

Author(s)- / Morton , R. A. /

Conference- IIASA Conference on World Gas Resources

Laxenburg

Austria (June 30 , 1980)

Publication date- July 1980

Pagination- 23 Pages

Report/patent- CONF-8006103-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-78ET11397 /

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin , USA

Descriptor(s)- / Aquifers / Geology / Geopressured reservoirs / Gulf Coast / Methane / Sand / Stratigraphy / Testing / Texas / Well drilling /

Abstract by NTIS

Six tests of geopressured aquifers have yielded between 3.6 to 4.5 m exp 3 /m exp 3 (20 to 25 scf/bbl) of gas. These low gas concentrations are attributed to high salinities, that in all tests exceeded 100,000 mg/l, but undersaturated conditions cannot be ruled out completely. Research efforts are designed to delineate the geographic and stratigraphic variations in salinity and to recognize regional and local trends so that zones of lower salinity and higher gas concentration can be identified. Moreover, well logs and seismic data are being used to develop methods of detecting low concentrations of free gas in watered-out gas sands and in thin sands that were considered as noncommercial prior to renewed interest in unconventional gas supplies.

670. GGIS-100407/O/ / /A/ / / / /

Title- Methane Extraction from Geopressured Geothermal Brine at Wellhead Conditions

Author(s)- / Quong , R. / Owen , L.B / Locke , F.E. / Otto , C.H. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 819 , 4 Pages

Geopressured Geothermal Bibliography

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vase! W. Roberts

Available- Geothermal Resources Council
P.O. Box 98
Davis
CA
95616

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C. (USA) /

Auxiliary expression(s)-

Illus. / Diagram (6) / Graph (1) /
Ref.

Descriptor(s)- / Cost / Elevated pressure / Elevated temperature /
Geopressured reservoirs / Geopressured wells / Geothermal brines
/ Geothermal fluids / Injectability / Injection / Injection
pumps / Methane / Recovery processes / Resource development /
Wellheads /

Abstract by GGIS

Disposing of geopressured-geothermal brine effluents is
costly in comparison to the expected revenues from sale of the
resource. One option that would provide a better balance of
costs is to maintain higher than normal pressure at the
production wellhead to reduce the injection pumping load work.
However, in order for this method to be cost effective, a
significant amount of CH₄ must remain in solution and be
recovered. Of particular concern is finding a way to extract
dissolved CH₄ at elevated pressures and temperatures. Two
methods look promising-- solvent extraction, and using hydraulic
motors or turbines coupled to CH₄ recovery systems.

671. GGIS-100393/O/ / /A/ // //

**Title- Methane Solubility in Aqueous NaCl Solutions at Elevated
Temperatures and Pressures**

Author(s)- / Blount , Charles W. / Price , Leigh C. / Wenger , Lloyd
M. / Tarullo , Michae /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1225 , 38 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

ET-78-S-07-1716 /

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (16) /
Table

Ref.

Descriptor(s)- / Aqueous solutions / Elevated pressure / Elevated
temperature / Equations / Experimental results / Laboratory

studies / Measuring methods / Methane / Resource assessment /
Sodium chloride / Solubility / Statistical models /

Abstract by Author

The solubility of methane in water and in various concentrations of aqueous NaCl solutions has been experimentally measured at a range of elevated temperatures and pressures. Increasing pressure and increasing temperature both result in an increase in the solubility of methane in water and in aqueous NaCl solutions. Increasing the NaCl concentration at constant temperature and pressure markedly decreases the solubility of methane. In log-log plots, methane solubility increases linearly with increasing pressure at constant temperature and constant NaCl concentration; it decreases linearly with increasing NaCl concentration at constant temperature and pressure. An empirical equation was derived from the solubility data using regression analysis. Using this equation, one can interpolate aqueous methane solubilities (to 6 percent) for any given temperature over the range from 212 DEG to 464 DEG F, pressure from 2,000 to 22,500 psi, and NaCl concentration from 0.3 to 25 weight percent.

672. GGIS-100528/0/ / /A/ / / / /

Title- Methane Solubility in Brines with Application to the Geopressured Resource

Author(s)- / Price , Leigh C. / Blount , Charles W. / MacGowan , Don /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 205 , 10 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)
ET-78-S-07-1716 /

Auxiliary expression(s)-
Illus. / Graph (8) /
Table
Ref.

Descriptor(s)- / Brines / Data / Empirical equations / Experimental results / Methane / Solubility /

Abstract by Author

This study reports on a large amount of experimentally determined aqueous methane solubility data over a wide range of temperature, pressure and salinity conditions. This data compares well with other previously published experimental data. An empirical equation has been developed which allows the calculation of aqueous methane solubilities from 158 to 464 deg F at pressures above 3,500 psi and from 464 to 601 deg F at pressures above 5,000 psi for all salinities. Other previously published empirical equations appear to be invalid. Salt composition appears to have no measurable effect on methane solubility. Carbon dioxide content in the waters has large and unexpected effects on methane solubility. Previously unreported large concentrations of carbon dioxide exist in geopressured sandstone pore waters. These two facts have great import to the

geopressured resource in regards to whether sandstone pore waters are methane saturated or not, as well as to the presence or absence of free gas. We do not have enough experimental data to say with certainty if Gulf Coast geopressured sandstone reservoirs are methane saturated or not. Closer cooperation between laboratory and field studies will be necessary to speak to this problem.

673: GGIS-100182/P/ / /M/ / / / /

Title- Method for Increasing the Recovery of Natural Gas from a Geo-Pressured Aquifer

Author(s)- / Cook, H. L., JR. / Geer, E. C. / Katz, D. L. /

Publication date- August 9, 1977

Report/patent- 4,040,487 (U.S. Patent

Note- to Transco Energy Co. Filed Date 24 May 1976

Descriptor(s)- / Aquifers / Enhanced recovery / Geopressured systems / Natural gas / Natural gas wells / Well stimulation /

Abstract by DOE/RECON

A method of increasing the recovery of natural gas from a geopressured aquifer containing water and gas and having a zone of free gas dispersed in water; by providing one or more wells extending from the surface to and completed in the geopressured aquifer in said zone and allowing the aquifer to flow water and gas under natural pressure through the well and lowering the pressure in the aquifer sufficiently to allow the gas to be released from solution in the water whereby the gas released will migrate more freely to the well and be produced. Also, any gas-phase saturation in the aquifer and any deposit of gaseous hydrocarbons in the formation in pressure communication with the wells will expand due to lowered aquifer pressure and be encouraged to flow to the wells and be recovered. Preferably, the wells are produced at a high enough rate of production to reduce the existing aquifer pressure in the drainage area of the wells as quickly as possible so that gas may be released from solution in the water and so that gaseous hydrocarbons in the formation may expand and flow to the wells. A high initial flow rate of at least 15,000 barrels of water per day from each well is necessary to effect the lowering of the aquifer pressure by at least 25 percent in order to provide the necessary mobility of the gas to obtain the enhanced gas recovery by the present method.

674: GGIS-100183/P/ / /M/ / / / /

Title- Method for Increasing the Recovery of Natural Gas from a Geo-Pressured Aquifer

Author(s)- / Cook, H. L., JR. / Geer, E. C. /

Publication date- August 16, 1977

Report/patent- 4,042,034 (US Patent

Note- to Transco Energy Co. Filed Date 24 May 1976

Descriptor(s)- / Aquifers / Enhanced recovery / Geopressured systems / Natural gas / Natural gas wells / Well stimulation /

Abstract by DOE/RECON

A method is claimed of increasing the recovery of natural gas from a geopressed aquifer containing water and gas and having a zone of free gas dispersed in water, by providing one or more wells extending from the surface to and completed in the geopressed aquifer in said zone and allowing the aquifer to flow water and gas under natural pressure through the well and lowering the pressure in the aquifer sufficiently to allow the gas to be released from solution in the water whereby the gas released will migrate more freely to the well and be produced. Also, any gas-phase saturation in the aquifer and any deposit of gaseous hydrocarbons in the formation in pressure communication with the wells will expand due to lowered aquifer pressure and be encouraged to flow to the wells and be recovered. Preferably, the wells are produced at a high enough rate of production to reduce the existing aquifer pressure in the drainage area of the wells as quickly as possible so that gas may be released from solution in the water and so that gaseous hydrocarbons in the formation may expand and flow to the wells. A high initial flow rate of at least 15,000 barrels of water per day from each well is necessary to effect the lowering of the aquifer pressure by at least 25 percent in order to provide the necessary mobility of the gas to obtain the enhanced gas recovery by the present method.

675. GGIS-100995/ / / /A/ / / / /

Title- Methodology of Socioeconomic Impact Assessments of Geothermal Energy Development

Author(s)- / Meidav, Mae Z. /

Publication date- Vol. 2, Issue 2, 1978

Pagination- Page 433, 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Energy source development / Environmental effects /
Geothermal energy / Socio-economic factors /

Abstract by Author

Impacts which are likely to be perceived as having the greatest positive consequences include: (1) decreasing rate of depletion of oil and gas, because of substitution by geothermal energy; (2) reduction in the amount of imported energy; (3) development of industries that use geothermal electricity, heat, or minerals in geothermal regions; (4) increase in government income; (5) reduction of inflation rate due to lower energy cost; (6) improvement in GNP. Impacts which are likely to be perceived as having greatest negative consequences, in decreasing rank order, were ranked as follows: (1) increased possibility of seismicity and land subsidence due to geothermal fluid extraction; (2) increased noise level, especially during drilling and development; (3) diminished water and air quality near geothermal installations; (4) relocation of local population in

order to accommodate geothermal installations; (5) use of recreation, park, and wilderness areas for geothermal installations; (6) use of agricultural and forest lands for development of geothermal installations.

676. GGIS-100064/J/ / 1304/A/ / / / /

Title- Methods of Detecting Abnormal Formation Pressure Zones

Original Title- Metody Wykrywania Stref O Anomalnym Cisnieniu Zlozowym

Journal- Tech. Poszukiwan

Publication date- Vol. 13, Issue 4, 1974

Pagination- Page 34, 9 Pages

Language- Polish

Auxiliary expression(s)-

Sum.

Illus.

Descriptor(s)- / Well logging / Geophysical exploration / Petroleum / Uses / Seismic methods / Production / Detection / Formation pressure / Techniques / Radioactivity / Neutron / Conductivity / Resistivity / Acoustic monitoring / Geopressure / Drilling / Pressure buildup / Sedimentation / Rates / Tectonics / Artesian waters / Salt / Anhydrite / Rehydration / Clay / Diagenesis / Osmosis /

677. GGIS-100117/ / / /M/ / / / /

Title- Methods Developed for Gravel Packing High-Pressure Unconsolidated Zones

Author(s)- / Szescila, A. J. /

Note- This citation, entered as monograph pending correction of transmission failure at acquisition, is probably journal article or conference paper. CF. ASMSA4 SEP 21-25 1975(5).

Descriptor(s)- / Oil wells / Bottom hole pressure / Oil well completion / Petroleum reservoir engineering / Gravel packing /

Abstract by NTIS

Recent improvements in down-hole completion tools, fluids, and gravel-packing methods have made it possible to pack off and subsequently produce unmanageable geopressured zones. The techniques, field proven for both upper and lower-zone packs, are compatible with any currently used carrying agent or workover fluid. The basic tool alignment requires minor modifications of the conventional crossover-tool assembly. The entire system has successfully functioned in fluids weighing 17.8 Lb/Gal. 3 refs.

678. GGIS-100528/O/ / /A/ / / / /

Title- Microseismicity Associated with Development of Gulf Coast Geopressured-Geothermal Energy Wells

Subtitle- Two Studies, Pleasant Bayou No. 2 and DOW L.R. Sweezy No.

1

Author(s)- / Mauk , Frederick J. / Sorrells , Gordon G. / Kimbal ,
 Billie C. /
 Conference- Fifth Conference on Geopressured-Geothermal Energy (
 October 13 , 1981)
 Publication date- 1981
 Pagination- Page 105 , 4 Pages
 Local Availability- GGIS
 Local Availability- CES
 Auxiliary expression(s)-
 Illus. / Figure (3) / Graph (2) / Map (2) /
 Descriptor(s)- / Brazoria County / Geopressured wells / Geothermal
 wells / Gulf Coast / L.R. Sweezy No. 1 Well / Louisiana /
 Microseisms / Pleasant Bayou No. 2 Well / Texas / Vermilion
 Parish /
 Abstract by GGIS
 Teledyne Geotech has monitored the microseismicity in the
 areas surrounding the Pleasant Bayou No. 2 Well and the Dow L.R.
 Sweezy No. 1 Well since September 1978 and August 1980,
 respectively. These programs have been designed to monitor
 regional seismological activity both before and after
 high-volume brine production and disposal from these
 geopressured wells.

 679. GGIS-100002/0/ / 3/A/ // //

Title- Mineralogy of Montmorillonite Under Elevated Temperature and Pressure

Author(s)- / Rieke , Herman H., 3. /
 Conference- Abnorm. Subsurf. Pressure
 Baton Rouge
 Louisiana
 USA
 Publication date- Vol. 3 , 1972
 Pagination- Page 89 , 16 Pages
 Auxiliary expression(s)-
 Illus.
 Descriptor(s)- / Minerals / Clay minerals / Montmorillonite /
 Diagenesis / Transformation / P-T conditions / Geopressure /
 Geothermal gradient / Crystal structure / Experimental studies /
 Sea water / Sediments / Mixed layer /

 680. GGIS-100533/0/ / /A/ // //

Title- Modeling the Risks of Geothermal Development

Author(s)- / Golabi , K. / Nair , K. / Rothstein , S. / Sioshansi ,
 F. /
 Conference- Sixth Workshop on Geothermal Reservoir Engineering (
 December 16 , 1980)
 Publisher- Stanford Geothermal Program, Stanford University
 Stanford, CA
 Publication date- 1980
 Pagination- Page 380 , 4 Pages
 Local Availability- GGIS
 Corporate Author- Woodward-Clyde Consultants

Geopressured Geothermal Bibliography

San Francisco , CA , USA
Auxiliary expression(s)-
Illus. / Diagram (2) /
Ref.
Descriptor(s)- / Capital / Cost / Cost benefit analysis / Development
/ Geothermal energy / Geothermal industry / Investments / Models
/ Risk assessment /
Abstract by GGIS
A method using objective submodels for quantifying the areas
of uncertainty in geothermal energy development, as well as a
framework for totalling potential risks, is presented.

681. GGIS-100282/ / / /M/ / / / /

**Title- Modeling Injection and Aquifer Pressure for Geothermal
Disposal Wells**

Author(s)- / Sun , Jimmy A.F. /
Publication date- 1977
Pagination- 86 Pages
Available- Center for Energy Studies
University of Texas at Austin
ENS 143
Austin
Texas
78712
(Paper Copy)
Local Availability- CES
Corporate Author- Texas Univ. Austin
Center for Energy Studies, Geothermal Div.
Austin , Texas , USA

Auxiliary expression(s)-
Table
Illus. / Figure (12) /
Ref.
Appendix

Descriptor(s)- / Aquifers / Boron / Bottom hole pressure / Brazoria
County / Computer calculations / Depth / Disposal wells /
Elements / Flow rates / Fresh water / Geopressured reservoirs /
Geopressured wells / Gulf Coast / Injection wells / Miocene epoch
/ Models / Natural gas deposits / Petroleum deposits /
Pleistocene epoch / Reservoir pressure / Reservoir properties /
Salinity / Sandstone / Surface disposal / Texas / Trace amounts /
Water production / Well logging / Well spacing /

Abstract by Author (rev.)

In the geopressured geothermal test well project, water produced
(at a rate of 20,000 to 40,000 barrels per day) from Pleasant
Bayou No. 2 well will probably have to be disposed of by
injection into shallower sandstone reservoirs. High salinity
(40,00 to 60,000 ppm) and possible high concentration of certain
trace elements, such as boron, will probably prohibit water
disposal at the surface. It is anticipated that for each
producing geothermal well several disposal wells will have to be
drilled into the shallower, thick sandstones of Miocene to
Pleistocene age. The disposal interval must be located beneath
the deepest freshwater zones and above the shallowest oil and gas
zones. Thus, in the area of the test well site the disposal

interval will be between the depths of 2,000 and 7,000 feet. From existing well logs from this area, it is estimated that in this 5,000 foot interval there will be 1,500 to 1,800 feet of sandstone suitable for injection of the geothermal water. In this study, the author has developed a computational model to simulate well bore pressure at different reinjection rates during salt water disposal, and another program to calculate the average reservoir pressures, at different times and flow rates. The features of the model include provisions for: (1) infinite acting or bounded aquifers (2) multiple injection wells (3) variation in average reservoir properties (ϕ , k , h) and fluid properties (μ , c , B sub:w) (4) variation in injection rate with time. The model is based upon the superposition of line source and sink solutions.

682. GGIS-100533/O/ / /A/ / / / /

Title- Modelling From a User's Point-of-View

Author(s)- / Bixley , P.F. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 238 , 5 Pages

Local Availability- GGIS

Corporate Author- Ministry of Works and Development
Wairakei , New Zealand

Auxiliary expression(s)-
Ref.

Descriptor(s)- / Data / Development / Hot water systems / Information
needs / Management / Methods / Models / Productivity / Wairakei
Geothermal Field / Well information systems /

Abstract by GGIS

The objective of reservoir modelling should be to provide useful data for reducing the high risks of geothermal development to all those involved with the management, here called "users," of a geothermal resource. The appropriate data useful for making sound financial and engineering decisions is considered from the "user's" point-of-view. The success of the Wairakei project is exemplary.

683. GGIS-100051/J/ / /A/ / / / /

Title- Models for Calculating Density and Vapor Pressure of Geothermal Brines

Author(s)- / Potter , Robert W., II / Haas , John L., Jr. /

Publisher- U. S. Geological Survey

Publication date- Vol. 6 , Issue 2 , March 1978

Pagination- Page 247 , 11 Pages

Corporate Author- Geological Survey
Menlo Park , California , USA

Auxiliary expression(s)-
Ref.

Geopressured Geothermal Bibliography

Descriptor(s)- / Chemical properties / Density / Equations /
Geopressured reservoirs / Geothermal brines / Geothermal
reservoirs / Models / Salinity / Thermodynamic properties /
Turbines / Vapor pressure / Volume /

Abstract by Compendex

In a model for estimating density of a brine, the density of a natural brine at a known temperature, pressure, and composition can be calculated from the densities of the component salt solutions in the complex brine. The model developed for estimating vapor pressure require two direct or indirect estimates of the vapor pressure and uses a published "reference-substance principle" to extrapolate these data 200 degrees to 300 degrees above the temperature of the highest observation. The methods can be used to estimate the partial molal volume and partial molal enthalpy of H sub-20 in the natural brine and the partial molal volume change and partial molal heat change for the H sub-20 component in the vaporization process. The equations for density and vapor pressure and the derived thermochemical properties will help in designing turbines for operation with geothermal and geopressured brines, in optimizing production conditions, and physical and chemical modeling of a geothermal reservoir.

684. GGIS-100066/J/ / /A/ / / / /

Title- Mud Gas Logs Help Predict Occurrence of Geopressures

Author(s)- / Daw , Robert N. / Myers , Donald L. / Mercer , Richard F. /

Publication date- Vol. 184 , Issue 2 , February 1 , 1977

Pagination- Page 43 , 4 Pages

Auxiliary expression(s)-

Illus. / Figure (7) /

Descriptor(s)- / Drilling fluids / Geopressure / Oil drilling / Well logging /

Abstract by Compendex

Mud gas logging techniques used in detecting and controlling overpressurized zones, especially in wildcats are described. Resulting detailed information will allow overpressured sections to be penetrated safely. Nomenclature used in mud gas logging is briefly defined.

685. GGIS-100274/R/ / /M/ / / / /

Title- National Geothermal Information Resource

Subtitle- Annual Report, 1977

Author(s)- / Phillips , Sidney L. /

Publication date- April 19 , 1978

Pagination- 68 Pages

Report/patent- LBL-7803

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA). Div. of Basic Energy Science
W-7405-ENG-48

Sponsor- / Department of Energy, Washington, D.C. (USA). Div. of Biomedical and Environmental Research

Sponsor- / Department of Energy, Washington, D.C. (USA). Div. of Geothermal Energy /

Corporate Author- California Univ.

Lawrence Berkeley Lab.

Berkeley, USA

Auxiliary expression(s)-

Illus. / Photo (1) / Graph (3) / Figure (13) /

Table

Ref.

Descriptor(s)- / Brine treatment / Brines / Data analysis / Direct energy utilization / Documentation / Energy conversion / Environmental effects / Evaluation / Exploration / Ground subsidence / Hydrogen sulfides / Information systems / Magma / Research programs / Resource assessment / Saline aquifers / Viscosity /

Abstract by Author (rev.)

The National Geothermal Information Resource (GRID) of the Lawrence Berkeley Laboratory is chartered by the U.S. Department of Energy (DOE) to provide critically evaluated data and other information for the development and utilization of geothermal energy. Included are both site dependent and site independent information related to resource evaluation, electrical and direct utilization, environmental aspects, and the basic properties of aqueous electrolytes. There are currently three U.S. data centers working to implement the collection and exchange of information on geothermal energy research and production: the DOE Technical Information Center (TIC), Oak Ridge, the GEOTHERM database of the U.S. Geological Survey in Menlo Park, and the GRID project. The data systems of TIC, GEOTHERM and GRID are coordinated for data collection and dissemination, with GRID serving as a clearinghouse having access to files from all geothermal databases including both numerical and bibliographic data. The GRID program also maintains interfaces with relevant data efforts; for example, the National Standard Reference Data System for collection and evaluation of basic numerical data. Standards for interchange of bibliographic data are patterned after that of the International Atomic Agency's International Nuclear Information System (INIS). Utilization of the INIS format ensures compatibility with other INIS styled computer centers. Data is available in the form of bibliographic compilations, numerical tables, or graphical displays disposed to paper, film or magnetic tape. In addition to the maintenance of a current geothermal database, the program is responsible for literature reviews and critical evaluations of the status of data by the technical staff. The program is organized into four principal areas: (1) basic geothermal energy data; (2) site-dependent data for both electrical and direct utilization; (3) environmental aspects, and (4) data handling development. The four sections of the report are organized in this way.

686. GGIS-100062/J/ / 191/A/ / / / /

Title- Natural Gas

Subtitle- United States Has It if the Price is Right

Author(s)- / Maugh , T. H., 2. /

Journal- Science

Publication date- Vol. 190 , Issue 4213

Descriptor(s)- / Charges / Coal / Control / Cost / Economics / Energy
supplies / Exploration / Geopressured systems / Meetings /
Methane / Natural gas / Production reserves / USA /

Abstract by ERDA/RECON

Evidence was presented at a meeting of the National Research Council Forum on Potential Resources of Natural Gas that if gas companies were allowed to sell new gas at prices comparable to those already charged for intrastate deliveries, they might be able to tap already-identified sources that would greatly increase natural gas reserves. This price would remain competitive with the prices of alternative energy supplies. Four types of natural gas resources that are unexploited are examined, namely: gas trapped in coal deposits, gas from shales, gas from the tight sands, and gas from geopressured zones. The US has natural gas resources of about 8 trillion cubic meters that can be produced and sold at current prices, with an additional 18.5 trillion cubic meters of undiscovered natural gas in conventional deposits. (MCW)

687. GGIS-100077/R/ / /A/ / / / /

Title- Natural Gas from Geopressured Aquifers

(Chapter 3 of Natural Gas from Unconventional Geologic Sources)

Author(s)- / Hise , B. R. /

Publication date- 1976

Pagination- Page 41 , 23 Pages

Report/patent- FE-2271-1

Note- with discussion

Auxiliary expression(s)-

Illus. / Table (1) /

Descriptor(s)- / Gulf of Mexico / Economic geology / Natural gas /
Texas / Louisiana / Mississippi / United States / Gulf Coast /
Resources / Hydrocarbons / Occurrence / Geopressured zones /
Geopressure / Aquifers / Sedimentary rocks / Sandstone / Shale /
Recovery processes / Economics /

Abstract by GGIS

The Gulf of Mexico Salt Basin (including the South Louisiana area) may contain abundant reserves of natural gas held in solution in geopressured aquifers. Current geological research on geopressured aquifers focuses on two crucial questions concerning the recovery of natural resources from this area--the average amount of natural gas in solution in geopressured water, and the number of geopressured aquifers of sufficient size to allow economic recovery of natural gas. Although the technology for drilling such a geopressured well exists, a well this size has not been drilled to date. A pilot drilling program would provide drilling and production data useful to commercial

drilling ventures. However, before a pilot program can begin, the geological questions must be answered satisfactorily. Further concerns of geopressed natural gas production include resource marketing and compliance with institutional regulations.

688. GGIS-100053/J/ / /A/ / / / /

Title- Natural Gas from Geopressed Aquifers (Gulf Coast Reservoirs)

Author(s)- / Randolph , P.L. /

Publication date- Vol. 30 , Issue 3 , 1978

Pagination- Page 402

Descriptor(s)- / Aquifers / Coastal regions / Gulf Coast / Gulf of Mexico / Natural gas / Reservoir description / Geopressed systems /

689. GGIS-100077/R/ / /M/ / / / /

Title- Natural Gas from Unconventional Geologic Sources

(From Geopressed Zones of Gulf of Mexico, Appalachian Brown Shales, Tight Sands of Western Basins, and in Association with Coal)

Publication date- 1976

Pagination- 255 Pages

Report/patent- FE-2271-1

Corporate Author- National Research Council

Board on Mineral Resources

Washington , D.C. , USA

Descriptor(s)- / Coal deposits / Economics / Exploitation / Geologic structures / Geopressed systems / Gulf of Mexico / Natural gas / Natural gas deposits / Reserves / Sand / Shale / USA / Methane / Meetings /

Abstract by ERDA/RECON

There are four major types of occurrences of large amounts of methane that have not been exploited to any significant degree. These are (1) in the deep geopressurized zone of the Gulf Coast, (2) in association with the brown shales of the Appalachian and other Eastern Devonian-Mississippian basins, (3) in tight sands of the Uinta, Peceance, and other Western basins, and (4) in association with coal. In a series of thirteen written papers presented in a forum sponsored by the Board on Mineral Resources and in discussions following the presentation of papers evaluations were made of the nature and physical dimensions of these beds, the extent of the resource, recovery problems, economic and institutional problems, and the potential of the source both in the short-term and the long-term. The papers and discussions are compiled, together with a summary of the findings and conclusions. (JSR)

690. GGIS-100077/R/ / /A/ / / / /

Title- Natural Gas Resources of the Geopressured Zones in the Northern Gulf of Mexico Basin
(Chapter 1 of Natural Gas from Unconventional Geologic Sources)

Author(s)- / Jones , P. H. /

Publication date- 1976

Pagination- 17 Pages

Report/patent- FE-2271-1

Auxiliary expression(s)-

Illus.

Discuss.

Descriptor(s)- / Gulf of Mexico / Economic geology / Natural gas / United States / Texas / Louisiana / Gulf Coast / Resources / Exploration / Recovery processes / Economics / Occurrence / Basins / Sediments / Sand / Clay / Geopressured zones / Geopressure / Cenozoic Era /

Abstract by GGIS

Reservoir and geologic characteristics for geopressured natural gas are described. Clay and sand beds in growth-faulted blocks at depths of 9,600-16,000 ft. are those likely to produce methane saturated, high pressure hot water. Criteria for assessing the gas content of these reservoirs include depth to the top of the geopressure zone, sand bed thickness, porosity, pressure and temperature gradients, and methane saturation in fresh water as a function of pressure and temperature. Estimates show the presence of perhaps 100,000 Tcf of dissolved methane in Cenozoic deposits in the geopressured zone of the northern Gulf of Mexico. Recoverable reserves are believed to exceed 258.2 Tcf. Gas recovery can be achieved by a variety of schemes, the most attractive being a multiple use system in which geothermal energy, hydropressure energy and natural gas are derived simultaneously. A production concept is suggested whereby large rates of water withdrawal by multiple wells over broad areas lowers fluid pressure. As reservoir pressure declines, artificial gas caps will form which can be tapped in the same way as conventional gas wells. The economics of geopressured gas recovery are unproved, but development projects appear to be feasible, since the gas can easily be converted to methanol or marketed directly. The principal legal problem relates to ownership of the gas, since mineral rights law or ground water law could apply. Environmental problems to be solved are disposal of the saline water produced to recover the gas and land subsidence resulting from the withdrawal of large volumes of water.

691. GGIS-100179/O/ / /A/ / / / /

Title- Needed Studies for the Future

Author(s)- / Champlin , J. B. F. /

Publication date- 1975

Pagination- Page 18 , 6 Pages

Report/patent- CONF-7511133

Descriptor(s)- / Baseline ecology / Brines / Research programs / Data analysis / Energy source development / Environmental impacts / Functional models / Geology / Geopressured systems / Geothermal energy / Hot dry rock systems / Hydrology / Information needs / Recommendations / Systems analysis /

Abstract by DOE/RECON

It is suggested that future studies should clarify the systems within which variations in the environment occur, so that when actual, factual data is obtained, it fits and helps to calibrate or substantiate a functional model of what the natural operative system is. Future studies considered particularly germane to geothermal development are listed under the following headings: hydrogeothermal, hot rock, geopressured, hot brine and geomechanical.

692. GGIS-100346/R/ / /M/ / / / /

Title- New Concepts for Converting the Energy in Low- to Medium-Temperature Liquids, with Emphasis on Geothermal Applications

Author(s)- / Austin, A.L. / House, P.A. /

Publication date- September 20, 1978

Pagination- 18 Pages

Report/patent- UCRL-52583

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U.S. Department of Energy

W-7405-ENG-48 /

Corporate Author- California Univ., Livermore

Lawrence Livermore Lab.

Livermore, California, USA

Descriptor(s)- / Flashed steam systems / Geopressure resources / Geothermal energy conversion / Performance testing / Power generation / Thermal efficiency / Turbines / Working fluids / Geothermal power plants / Geopressured systems / Moderate temperature / Nozzles / Pumps / Waste heat /

Abstract by TIC

The Geothermal Development Program at Lawrence Livermore Laboratory has produced several novel expanders for liquids of low to medium temperatures (approx. 180 DEG C). A unique radial outflow reaction turbine (RORT) has been developed and laboratory-tested; results indicate that 50% engine efficiency is achievable. This work has led to a new concept called the velocity pump reaction turbine (VPRT), which could significantly increase the gross engine efficiency of the RORT. VPRT and its modifications are a unique family of turbines created specifically for expanding liquids to produce shaft work at potential engine efficiencies of up to 70%. Such devices, if used between the two separation stages of a double-flash system, could increase the overall power output by 15 to 20%, reducing power costs by at least 10% for about a 3% increase in capital costs. Geothermal applications are discussed with emphasis on geopressured resources. Also, these machines are suitable for utilizing solar heated fluids and waste heat sources from industrial processes.

693. GGIS-100265/J/ / /A/ / / / /

Title- New Discoveries Help Natural Gas Burn Brighter

Geopressured Geothermal Bibliography

Journal- Chemical Week
Publication date- Vol. 128 , Issue 2 , January 14 , 1981
Pagination- Page 36 , 4 Pages
Local Availability- GGIS
Auxiliary expression(s)-
Illus. / Map (7) /
Table
Descriptor(s)- / Brines / Geothermal brines / Industry / Natural gas /
Natural gas deposits / Reserves /
Abstract by GGIS
The potential in unconventional gas resources, including
geopressured gas, is discussed. Industry projections of energy
supply are made.

694. GGIS-100348/J/ / /A/ / / / /

Title- New Energy and Expanded Investment Credits Provide
Opportunities for Increased Savings

Author(s)- / Glanternik , Henry J. / Lipton , Charles N. /
Publication date- Vol. 23 , Issue 5 , November 1979
Pagination- Page 260 , 7 Pages
Descriptor(s)- / Equipment / Financial incentives / Gas production /
Geopressured reservoirs / Geothermal brine / Investment /
Natural gas / Taxes /

Abstract by ABI/Inform

As a stimulus to capital investment, the Revenue and Energy Tax
Acts of 1978 have: (1) liberalized the amount of investment
credits which can be used to reduce taxes each year and broadened
the types of property eligible for the regular investment credit,
and (2) created six new classes of business energy property which
may, in some cases, result in both energy tax credits and
investment tax credits. They are: (1) alternative energy
property which includes boilers and burners using primarily
alternate substances, (2) specially-defined energy property
which can include recuperators, heat wheels, and regenerators,
(3) recycling equipment used to sort and prepare solid waste for
recycling, (4) equipment used to extract oil from oil-bearing
shale rock, (5) equipment for producing natural gas from
geopressured brine, and (6) equipment using solar or wind energy
to generate heat, cooling, electricity, or hot water.
Depreciable tangible personal property with a life of at least 3
years is eligible for the investment credit.

695. GGIS-100385/R/ / /M/ / / / /

Title- New High Temperature Cementing Materials for Geothermal
Wells: Stability and Properties

Subtitle- Final Report

Author(s)- / Roy , Della M. / White , Elizabeth L. / Langton ,
Christine A. / Grutzeck , Michael W. /

Publication date- July 1980

Pagination- 85 Pages

Report/patent- BNL-51249

Available- NTIS

(Paper copy)
 (Microfiche)
 Local Availability- CES
 Sponsor- / Department of Energy, Washington, DC (USA)
 DE-AC02-76CH0016 /
 Corporate Author- Brookhaven National Lab.
 Geothermal Materials Group
 Upton , NY , USA
 Auxiliary expression(s)-
 Illus. / Diagram (12) / Photo (17) / Graph (24) /
 Table
 Ref.
 Descriptor(s)- / Chemical properties / Geothermal wells / High
 temperature / Performance / Permeability / Phase transformation
 / Physical properties / Stresses / Well cementing /
 Abstract by Author
 Potential high-temperature cements have been formulated and
 evaluated in terms of their properties for geothermal well
 cementing. Phase formation and compatibility in two major
 compositional regions were investigated in the temperature
 region between 200 and 400 DEG C and pressures up to 69 MPa
 (10,000 psi). These were followed by an evaluation of properties
 of the cements formed. One area in the system $\text{CaO-MgO-SiO}_2\text{-H}_2\text{O}$
 centered around the xonotilite-chrysotile join while the other
 area of interest centered around the anorthite composition in
 the system $\text{CaO-Al}_2\text{O}_3\text{-SiO}_2\text{-H}_2\text{O}$. After numerous exploratory
 studies, the magnesia-containing mixtures were prepared by
 mixing a Class J cement with various sources of magnesia such as
 calcined chrysotile, or magnesium oxide. Calcium oxide and
 silica fine quartz powder were also added to adjust the
 compositions. The aluminous system cements were formulated from
 high-alumina cements which were mixed with various silica
 source. The potential geothermal cements which have been
 developed have fulfilled the following general requirements: a)
 24-hour compressive strength greater than 6.9 MPa (1000 psi); b)
 water permeability less than 0.1 millidarcy; c) cement/steel
 bond strength greater than 0.07 MPa (10 psi); d) 96-day stability
 in hydrothermal water or 20% brine; e) noncorrosive to steel
 casing; f) 2-hour room temperature workability well within
 specifications; g) maintenance of pumpability at temperatures up
 to 350 DEG F (177 DEG C) for 4 hours. These cements hold promise
 as new geothermal cements, but additional long-term testing is
 still needed to fully evaluate their true potential. Some
 samples have been tested for pumpability, which has been shown to
 be adequate. Some have been submitted to the National Bureau of
 Standards (NBS) for their standard testing program.

 696. GGIS-100349/J/ / /A/ / / / /

Title- New Lease on Life for Gas
 Journal- Energy (Stamford, Conn.)
 Publication date- June 1979
 Pagination- 3 Pages
 Local Availability- CES
 Descriptor(s)- / Gas production / Geopressured zones / Gulf Coast /
 Louisiana / Natural gas / Texas /

Geopressured Geothermal Bibliography

Abstract by Compendex

Natural gas currently supplies about 25% of the total energy consumed in the United States. Unfortunately, the annual addition to gas reserves from new discoveries continues to be less than withdrawals. A decade ago, there were 15 years worth of reserves. At current production rates, there is about a 10-year supply. Much of the gas currently being produced in the U.S. is found in conjunction with oil. Supplemental supplies could come from coal gasification, Alaskan gas, imports from Canada and Mexico, LNG from the abundant resources now being flared, geopressured zones, Devonian shales, and tight formations in the West. Among the most promising unconventional sources of gas is the geopressured zone in the Texas and Louisiana Gulf Coast, reservoirs which contain hot, gas-saturated brine under high pressure. The huge coal reserve of the U.S. contains an estimated resource base of 2,500 trillion cubic feet, of which 350 trillion cubic feet is thought to be recoverable at costs up to \$4/thousand cubic feet. Consolidated Edison Co. and the nationwide study by AGA published in April 1977 concluded that, comparing coal consumption for electric generation and coal consumption for production of high Btu gas, coal gasification is up to 50% more efficient than coal gasification.

697. GGIS-100407/O/ / /A/ / / / /

Title- New Material

Subtitle- Copolymer Carbon Composite (CCC) for Hydrothermal Piping

Author(s)- / Wehlage, Edward F. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 653 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasel W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (3) /

Table

Ref.

Descriptor(s)- / Comparative evaluations / Corrosion / Corrosion protection / Design / District heating / Elevated temperature / Equipment / Experimental results / Geothermal heating / Industrial heating / Materials testing / Patents / Pipes / Planning / Scaling control / Stresses /

Abstract by GGIS

Selecting quality materials for geothermal piping used in district and industrial heating systems is important for reliable operation of the installation. Corrosion and scaling shorten the lifespan of geothermal piping; materials are being sought to overcome this problem. Four types of non-metallic materials show promise: thermoset plastics; asbestos cement; poly concrete; and copolymer carbon composite (CCC). The benefits of CCC are discussed in this article; its qualities reveal potential for a wide range of service in distributing hydrothermal fluids.

698. GGIS-100052/J/ / 1504/A/ // //

Title- New Pseudo Functions to Control Numerical Dispersion

Author(s)- / Kyte , J. R. / Berry , D. W. /

Journal- Soc. Pet. Eng. J.

Publication date- Vol. 15 , Issue 4 , 1975

Pagination- Page 269 , 8 Pages

Descriptor(s)- / Capillary flow / Comparative evaluations / Cross sections / Dispersions / Functional models / Geopressured systems / Heterogeneous effects / Liquid flow / Natural gas / Oil wells / Permeability / Petroleum / Petroleum deposits / Recovery processes / Reliability / Saturation / Simulation /

699. GGIS-100066/J/ / /A/ // //

Title- New Seismic Techniques Aid Petroleum Engineers

Author(s)- / Ausburn , Brian E. / Nemeth , L.K. / Reid , Gordon B. /

Publication date- Vol. 187 , Issue 6 , November 1978

Pagination- Page 52 , 6 Pages

Corporate Author- J. R. Butler & Co.

Houston , Texas , USA

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Enhanced recovery / Geopressured reservoirs / Petroleum exploration / Seismic surveys / Well drilling /

Abstract by Compendex

Benefits of new seismic developments include improved reserve determinations, better planning of enhanced oil recovery projects and optimum location of new drilling wells, all of which usually are handled by or are under control of the reservoir section. But others also can take advantage of the data. For example, drilling departments are becoming more adept at using seismic to predict occurrence and magnitude of geopressures. In fact, it is predicted that seismic expenditures by engineers will exceed those by explorationists in the near future.

700. GGIS-100234/J/ / /A/ // //

Title- New Source of Energy?

Subtitle- Moves Are Afoot to Tap the Vast Reserves of Geopressured Methane

Geopressured Geothermal Bibliography

Author(s)- / Born , Roscoe C. /
Journal- Barrons
Publication date- Vol. 59 , June 30 , 1979
Pagination- Page 9 , 3 Pages
Auxiliary expression(s)-
Illus. / Map (1) /
Descriptor(s)- / Exploitation / Exploratory wells / Financial
incentives / Drilling / Geopressure resources / Geopressured
reservoirs / Louisiana / Methane / Texas /
Abstract by Energyline
The potential of geopressured methane for supplying the U.S.
with energy is assessed. Estimates of the size of the resource
vary widely, from 5,000-50,000 TCF; most of this is in Texas and
Louisiana. President Jimmy Carter has plans to provide
incentives for exploiting the geopressured methane resource.
Several companies are conducting exploratory test drilling
programs. Middle South Utilities has leased 3,000 acres in
Louisiana for test wells; DOE drilled a well in Brazoria, Tex.,
and plans to install surface equipment soon; the Dow Chemical
Co. plans to drill another geopressured demonstration in a
reservoir of known but limited size; and Magma Gulf proposed to
drill on a prime site in Louisiana, and to utilize heat and
mechanical force as well as methane. Other projects are
described.

701. GGIS-100147/R/ / /M/ / / / /

Title- Nitinol Self-Descaling Surface for Geothermal Scale Control
Author(s)- / Weres , Oleh /
Publication date- June 1977
Pagination- 9 Pages
Report/patent- LBL-6324
Available- NTIS
(Paper copy)
(Microfiche)
Sponsor- / ERDA
W-7405-ENG-48 /
Corporate Author- California University, Berkeley
Lawrence Berkeley Laboratories
Berkeley , California , USA
Auxiliary expression(s)-
Illus. / Photo (2) /
Ref.
Descriptor(s)- / Alloys / Descaling / Scaling / Scaling control /
Abstract by ERA
The shape memory effect (SME) in nitinol is discussed. The
second memory phenomenon in nitinol wires which have been
working in a heat engine for some time is described. The ways
in which The SME may be applied to scale control are listed.
The demonstration of the concept with actual geothermal brine is
described. The application of SME in the kind of scaling
encountered at Cerro Prieto, Mexico is proposed.

702. GGIS-100022/J/ / 29/A/ // //

Title- Notes on the Physical Composition of the Earth's Interior Under Extreme P-T Conditions

Original Title- Beitrage Zum Stofflichen Zustand des Erdinnern aus Physikalischen Messungen Unter Extremen P,T-Bedingungen

Author(s)- / Rollstadt , H. / Seipold , U. /

Publisher- Akad. Wiss. DDR.
DDR

Journal- Akad. Wiss. DDR, Zentralinst. Phy. Erde, Veroeff.

Publication date- Issue 29 , 1974

Pagination- Page 33 , 12 Pages

Language- German

Auxiliary expression(s)-

Sum.

Illus.

Descriptor(s)- / Earth / Interior / Chemical composition / Sulfur /
Electrical properties / Theoretical studies / Geopressure /
Experimental studies /

703. GGIS-100315/O/ / /M/ // //

Title- Nuclear Energy and Alternatives

Author(s)- / Kadirglu , Osman Kemal / Perlmutter , ARnold / Scott ,
Linda /

Conference- International Scientific Forum on an Acceptable Nuclear
Energy Future of the World

Fort Lauderdale

Florida

USA (November 7 , 1977)

Publisher- Ballinger Pub. Co.
Cambridge, Massachusetts

Publication date- 1978

Pagination- 730 Pages

Local Availability- ENG

Corporate Author- Miami Univ.

Center for Theoretical Studies

Coral Gables , Florida , USA

704. GGIS-100181/O/ / /A/ // //

Title- Numerical Simulation of the Effects of Reinjection Upon the Performance of a Geopressured Geothermal Reservoir

Author(s)- / Pritchett , J. W. / Garg , S. K. / Riney , T. D. /

Conference- Geothermal; State of the Art

San Diego

California

USA (May 9 , 1977)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- 1977

Report/patent- CONF-770569--

Geopressured Geothermal Bibliography

Descriptor(s)- / Fluid withdrawal / Geopressured systems / Geothermal wells / Mathematical models / Reinjection / Simulation /
Abstract by DOE/RECON

A general computer model was developed which can be used to simulate the behavior of Gulf Coast geopressured geothermal reservoirs undergoing fluid production and/or fluid injection. The model considers all of the important drive mechanisms and their interactions and is capable of representing reservoir heterogeneity and anisotropy in one, two and three-dimensional configurations. The results of these calculations would seem to make a strong case for reinjection into geopressured aquifers as a production technique.

705. GGIS-100894/ / / /A/ / / / /

Title- Numerical Simulation of Geopressured Geothermal Reservoirs

Author(s)- / Garg, S.K. / Pritchett, J.W. / Rice, M. H. /

Conference- American Geophysical Union Spring Meeting

Washington

D.C.

USA (May 30 - June 3 , 1977)

Publication date- Vol. 58 , Issue 6 , June 1977

Pagination- Page 394 , 1 Pages

Note- Abstract only. Microfiche copies are available for a minimal fee from the American Geophysical Union

Available- American Geophysical Union

1919 K St., N.W.

Washington

D.C.

20006

(Microfiche)

Corporate Author- Systems, Science and Software

La Jolla , California , USA

Descriptor(s)- / Artificial recharge / Compaction / Compression / Gas production / Geopressured reservoirs / Mathematical models / Methane / Performance / Permeability / Reservoir engineering / Simulation / Waste water / Water influx /

Abstract by Author

A comprehensive theoretical formulation is presented for the important thermomechanical processes operative in a geopressured geothermal reservoir system. The formulation includes the effects of the four major reservoir drive mechanisms (water compressibility, reservoir rock compaction, evolution of methane gas, and influx of water from shale dehydration). A fully three dimensional multiphase (liquid water with dissolved methane) computer program has been developed for solving the system of governing equations. A preliminary series of calculations was made in which the input data for the simulator was varied to assess the sensitivity of the reservoir performance to (1) the presence of gaseous methane in the pores, (2) relative permeability, (3) sediment compaction, and (4) reinjection of the waste fluids. The principal effect of the free gas, sediment compaction and reinjection is to increase the producing life of the reservoir. Effects of relative permeability depend upon the amount of gas saturation in the pore fluid. Finally, the effect that reinjecting the processed fluid will have on the long-term

performance of a representative geopressured reservoir system was examined in some detail. The increase methane gas and thermal energy production are very great; however, no analysis of the energy recovered for the entire energy extraction cycle was made.

706. GGIS-100411/O/ / 1/A/ / / / /

Title- Numerical Simulation of Geopressured Geothermal Reservoirs

Author(s)- / Knapp , Roy M. / Riney , T. David /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 217 , 10 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Auxiliary expression(s)-

Illus. / Figure (4) / Graph (4) /

Ref.

Descriptor(s)- / Aquifers / Differential equations / Energy balance /

Geopressured systems / Heat transfer / Mass transfer /

Mathematical models / Simulation /

Abstract by Author

This paper discusses the governing equations describing mass and energy in geopressured geothermal reservoirs. A fully interacting rock-fluid system with rock porosity, permeability, and thermal conductivity dependent on the fluid and rock stresses is considered. The mathematical model includes the effects of solution and free natural gas. Sample calculations of a hypothetical hydrothermal reservoir are presented to show the applicability of reservoir simulation.

707. GGIS-100533/O/ / /A/ / / / /

Title- Numerical Studies of the Energy Sweep in Five-Spot Geothermal Production/Injection Systems

Author(s)- / O'Sullivan , M.J. / Pruess , K. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 204 , 9 Pages

Local Availability- GGIS

Corporate Author- California Univ.

Lawrence Berkeley Lab., Earth Sciences Division

Berkeley , USA

Auxiliary expression(s)-

Illus. / Graph (6) /

Ref.

Geopressured Geothermal Bibliography

Table
Descriptor(s)- / Artificial recharge / Brines / Energy recovery /
Flashed steam systems / Geothermal reservoirs / Geothermal wells
/ Hot water systems / Injection / Injection wells / Numerical
analysis / Production testing / Systems analysis / Vapor
dominated systems /

Abstract by GGIS

To improve the understanding of injection into geothermal reservoirs, three idealized problems are considered here: 1) a vapor-dominated, single layer reservoir; 2) a vapor-dominated, four layer reservoir; 3) a liquid-dominated, single layer reservoir. Calculations are made for a five-spot configuration of alternate, off-set rows of producers and injectors.

708. GGIS-100528/O/ / /A/ / / / /

Title- Occurrence of Geopressure in the Northern Gulf of Mexico Basin

(Map (Addendum))

Author(s)- / Wallace , R.H. / Wesselman , J.B. / Kraemer , T.F. /
Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- 1 Pages

Local Availability- GGIS

Local Availability- CES

Descriptor(s)- / Contour maps / Geopressured zones / Gulf of Mexico / Maps /

Abstract by GGIS

This multicolor map includes: contouring that shows the altitude of the top of the geopressured zone below National Geodetic vertical datum of 1925; major subsurface fault locations; the major federal outer continental shelf boundaries; and demarcations of parish/county lines as well as the location of major cities.

709. GGIS-100175/J/ / /A/ / / / /

Title- Occurrence, Prediction and Control of Geopressures on the Northwest Shelf of Australia

Author(s)- / Nyein , R. K. / MacLean , L. / Warris , B. J. /

Journal- APEA J.

Publication date- Vol. 17 , 1977

Pagination- Page 64 , 9 Pages

Auxiliary expression(s)-
Ref.

Descriptor(s)- / Australia / Blowouts / Diagrams / Exploration /
Geophysical surveys / Geopressured systems / Oil fields / Oil wells / Porosity / Pressure control / Pressure dependence /
Reservoir rocks / Well casings / Well drilling /

Abstract by DOE/RECON

Careful velocity studies are carried out by the geophysicists in areas without well control in order to outline zones of abnormally low velocities which are correlated with

geopressuring. From these data for any wildcat well, a suitable casing program can be devised prior to commencement of drilling. This will aim at sealing off any geopressured zones and thus allow rapid and trouble-free drilling with the correct mud density. During the drilling of the well, the modified 'D' exponent method is used to detect the actual zones of geopressuring within the well. These methods have allowed the problems of geopressures to be overcome and have considerably improved drilling times on the Northwest Shelf. A case history of one wildcat well Lewis No. 1A, is presented.

710. GGIS-100459/R/ / /M/ / / / /

Title- Offshore Basin Assessment for Oil and Gas Using Geochemical Data

Author(s)- / Bayliss , G.S. / Martin , S.J. / Cernock , P.J. / Carlisle , C.T. / Odiorne , J.D. /

Conference- 9. Offshore Technology Conf.

Publication date- 1977

Pagination- 8 Pages

Report/patent- OTC-2936

Available- GeoChem Laboratories, Inc.

1143-C Brittmore Road

Houston

TX

77043

(Paper copy)

Local Availability- CES

Corporate Author- GeoChem Laboratories, Inc.

Houston , TX , USA

Auxiliary expression(s)-

Illus. / Graph (3) / Map (1) /

Table

Ref.

Descriptor(s)- / Exploration methods / Geochemical surveys / Hydrocarbons / Methane / Natural gas deposits / Oil fields / Resource assessment / Resource potential / Sedimentary basins /

Abstract by Author

Basin assessment of oil and gas potential is, in general, based primarily on the volume of sedimentary rocks, the available reservoir, and by direct comparison with known production in similar sedimentary basins. However, this type of assessment is limited since source rock quality, geothermal diagenetic history (eometamorphism) and migration are not usually considered. Using routinely available geochemical data, it is possible to refine the basin assessment concepts and to derive more definitive values of the true oil and gas potential of a given exploration area. This rationale has been used to estimate the resource potential of leased acreage in the local area of the C.O.S.T. B-2 Well, Baltimore Canyon, Offshore Eastern United States.

711. GGIS-100078/B/ / /M/ / / / /

Title- Offshore Louisiana Oil and Gas Fields
Publisher- Lafayette Geological Society
Publication date- 1973
Pagination- 124 Pages
Corporate Author- New Orleans Geological Society

712. GGIS-100538/J/ / /A/ / / / /

Title- Oil Expulsion

Subtitle- A Consequence of Oil Generation
Author(s)- / Momper, James A. /
Journal- Bulletin of the South Texas Geological Society
Publication date- Vol. 20, Issue 5, 1980
Pagination- Page 5, 2 Pages
Local Availability- GGIS
Descriptor(s)- / Argillaceous rocks / Energy sources / Fluid pressure
/ Fluids / Fossil fuels / Pressure drop /
Abstract by FC

The behavior of a source-rock system is explained, and the conditions for operation are stated.

713. GGIS-100995/ / / /A/ / / / /

Title- On Transient Temperature Inversions in Geothermal Boreholes

Author(s)- / Lowell, R.P. / Chen, C.H. / Fulford, J.K. /
Publication date- Vol. 2, Issue 2, 1978
Pagination- Page 407, 3 Pages
Available- Geothermal Resources Council
P.O. Box 98
Davis
California
95616
Local Availability- CES
Corporate Author- Georgia Inst. of Tech.
School of Geophysical Sciences
Atlanta, Georgia, USA
Auxiliary expression(s)-
Illus. / Graph (1) /
Ref.
Descriptor(s)- / Boreholes / Drilling fluids / Geothermal reservoirs
/ Geothermal wells / Models / Permeability / Reservoir
temperature / Temperature inversions / Temperature logging /
Abstract by Author (rev.)

Normally, the temperature increases with depth in the earth's crust. In geothermal areas, however, temperature profiles often show a rapid increase with depth over the first few hundred meters followed by a nearly isothermal region; and in many cases, there exist temperature inversion, regions in which the temperature decreases with depth. There is one class of temperature inversions which involves transient temperature inversions due to drilling disturbances. Very often in drilling a geothermal well, drilling fluid is lost from the wellbore into the adjacent rock formation since the drilling fluid is typically much cooler than the rock. Temperature logs taken

shortly after the injection of drilling fluid will show a region containing a temperature decrease with depth. After drilling ceases, the borehole will gradually return to equilibrium, and the artificially induced temperature inversion will disappear. The purpose of this paper is to give some simple models for the generation of temperature inversions which may result from the injection of drilling fluid into a formation and the subsequent relaxation of such inversions after drilling ceases.

714. GGIS-100512/R/ / /M/ / / / /

Title- Operations Research and Systems Analysis of Geopressured-Geothermal Energy in Louisiana

Subtitle- Final Report for the Period June 1, 1978 - August 31, 1979

Author(s)- / Johnson , A. E. /

Publication date- November 1980

Pagination- 295 Pages

Report/patent- DOE/ET/27085-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

FG08-78ET27085 /

Corporate Author- Louisiana Dept. of Natural Resources

Baton Rouge , USA

Descriptor(s)- / Commercialization / Economic analysis / Energy demand / Energy source development / Forecasting / Geopressured zones / Louisiana / Mathematical methods / Regional analysis / Sensitivity analysis / Socio-economic factors /

Abstract by NTIS

The primary purpose was to provide a projection of the probable future contribution of the geopressured geothermal energy resource in Louisiana to the overall energy requirements of the nation. A number of associated objectives were emphasized: namely, development of the tools and methodology for performing economic analyses, application of these tools to specific prospects about which adequate resource assessments have been made, identification of the impediments to resource development, and socio-economic analysis of the impact of development of the resource on these specific prospects. An overview of the geopressured-geothermal resource activities in Louisiana is provided first, followed by a detailed discussion and review of the achievements of this project. Finally the major conclusions and findings of this project with respect to commercial viability, impediments, and social and economic impact are presented, and recommendations are made for future systems analysis work.

715. GGIS-100322/R/ / /M/ / / / /

Title- Operations Research and Systems Analysis of Geopressured/Geothermal Resources in Louisiana

Subtitle- Final Report for Initiation Project

Geopressured Geothermal Bibliography

Author(s)- / Wilkins , Bert, Jr. /

Publication date- February 1978

Pagination- 180 Pages

Report/patent- ORO-5442-1

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Energy Research and Development Administration

EG-77-S-05-5442 /

Corporate Author- Louisiana State Univ.

Baton Rouge , Louisiana , USA

Auxiliary expression(s)-

Illus. / Figure (1) / Diagram (1) / Map (2) /

Table

Ref.

Appendix

Descriptor(s)- / Energy source development / Geopressure resource /

Louisiana / Planning / Research programs / Resource assessment /

Systems analysis /

Abstract by Author

The overall objective of this project was to develop a plan for Louisiana's participation in a Gulf Coast regional operations research and systems analysis activity. To achieve this overall objective, the following subobjectives were proposed: (1) a set of preliminary planning scenarios for geopressured geothermal resource development in Louisiana will be prepared and analyzed; (2) key decision makers and "stake holders" with respect to geopressured geothermal energy policy in the state of Louisiana will be identified; (3) a state-wide advisory group for geopressured geothermal resource development in Louisiana will be established; (4) operations research activities will be coordinated with a parallel project in the state of Texas; (5) specific recommendations for a regional operations research activity in support of geopressured geothermal resource development in the Texas-Louisiana region will be formulated. This final report gives the status of these subobjectives.

716. GGIS-100248/R/ / /M/ / / / /

Title- Operations Research and Systems Analysis of
Geothermal/Geopressured Resources in Texas

Subtitle- Final Report

Author(s)- / Zinn , C. Dale /

Publication date- December 1977

Pagination- 86 Pages

Available- Center for Energy Studies

Engineering Science Bldg. 143

The University of Texas at Austin

Austin

Texas

78712

(Paper copy)

Local Availability- CES

Sponsor- / US ERDA

EG-77-S-05-5443 /

Corporate Author- Texas University, Austin
Center for Energy Studies
Austin , Texas , USA

Auxiliary expression(s)-
Illus. / Map (1) /
Table
Ref.

Descriptor(s)- / Energy source development / Economic analysis / Frio
Formation / Geopressured resources / Geopressured zones / Gulf
Coast / Operations research / Planning / Systems analysis / Texas
/

Abstract by Author (Rev.)

The Center for Energy Studies at the University of Texas at Austin has contracted with ERDA to perform an operations research and systems analysis of the geothermal geopressured resources in Texas. The planning support project has concentrated on the development of the geopressured resources of the Texas Gulf Coast. A similar project at Louisiana State University is dealing with the geopressured resources of the Louisiana Gulf Coast. The objective of the projects is the formulation of a coordinated regional plan for the development of the geothermal/geopressured energy resources in the Texas/Louisiana region. The primary goal of this project is the preparation and analysis of preliminary geothermal geopressured energy development scenarios for the state of Texas. A secondary goal is the establishment of a regional organization to continue the planning support activity so that more comprehensive development plans can be formulated and analyzed. This report describes the status of the project and reflects the accomplishment of the goals of the project. The report also outlines the projected continuation of the present work and the work directed toward establishment of additional objectives.

717. GGIS-100995/ / / /A/ / / / /

Title- Optimization of Geothermal Cycle Shell and Tube Exchanges of
Various Configurations with Various Fluid Properties and Site
Specific Fouling

Author(s)- / Pope , W.L. / Pines , H.H. / Silvester , L.F. / Doyle ,
P.A. / Fulton , R.L. / Green , M.A. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 539 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- California Univ., Berkeley

Lawrence Berkeley Lab.

Berkeley , California , USA

Auxiliary expression(s)-

Illus. / Graph (2) /

Table

Ref.

Descriptor(s)- / Binary cycle power generation / Computer codes /
Economics / Fouling / Geothermal brines / Heat exchangers /
Models / Rankine cycle / Working fluids /

Abstract by Author

A new heat exchanger design program, SIZEHX, is described. This program allows single step multiparameter cost optimizations on single phase or supercritical exchanger arrays with variable properties and arbitrary fouling for a multitude of matrix configurations and fluids. SIZEHX uses a simplified form of Tinker's method for characterization of shell side performance; the Starling modified BWR equation for thermodynamic properties of hydrocarbons; and transport properties developed by NBS. The report will include results of four parameter cost optimizations on exchangers for specific geothermal applications. The relative mix of capital cost, pumping cost, and brine cost (\$/.Btu) are determined for geothermal exchangers illustrating the invariant nature of the optimal cost distribution for fixed unit costs.

718. GGIS-100453/R/ / /M/ / / / /

Title- Optimization of Geothermal Home Heating Systems

Author(s)- / Culver, G. Gene /

Publication date- October 1976

Pagination- 46 Pages

Report/patent- 76-2

Available- Geo-Heat Utilization Center

Oregon Institute of Technology

Klamath Falls

OR

97601

(Paper copy)

Local Availability- CES

Sponsor- / Energy Research and Development Administration, Idaho
Falls, ID (USA). Idaho Operations Office

E(10-1)-1548

Sponsor- / Idaho National Engineering Lab., Idaho Falls (USA)

E(10-1)-1548 /

Auxiliary expression(s)-

Illus. / Diagram (6) / Graph (1) /

Table

Ref.

Descriptor(s)- / Comparative evaluations / Cost / Direct energy
utilization / Geothermal space heating / Heat exchangers / Hot
water heating / Houses / Optimization /

Abstract by Author

The objectives of this study were to determine which type of residential heating system would be applicable for various temperature ranges of geothermal water and which type would be the most economical in those ranges. Four major types of home heating systems--baseboard convectors, forced air, radiant panels and heat pumps--were investigated based on the assumption that geothermal waters between 210 deg and 70 deg F were available. Forced air systems can utilize geothermal water in the temperature range 125 deg to 210 deg F, baseboard convector systems 160 deg to 210 deg F, radiant panel systems 120 deg to

210 deg F, and heat pumps 70 deg to 80 deg F or slightly above. General system design is briefly discussed and initial installation cost calculations indicate that baseboard convectors are the most economical to install and radiant ceiling panels the most expensive. Annual operating cost calculations indicate that baseboard convectors are the most economical in the temperature range 150 deg to 210 deg F and radiant floor panels are more economical below 150 deg F. Heat pumps are the most expensive when used for heating alone; however, cooling or combined cooling and heating costs were not investigated. When cooling is desired and water in the temperature range 70 deg to 80 deg F is available, water to water heat pumps will be competitive. Interviews with occupants of residences with the four types of systems were held in an attempt to determine what factors other than economics might be considered in choosing between the systems. Certain portions of the information generated could apply to waste heat utilization for space heating as well as geothermal space heating since the basic designs are very similar.

719. GGIS-100528/O/ / /A/ / / / /

Title- Organic Geochemistry of the Sweet Lake Geopressed Test Well

Author(s)- / Bayliss, Geoffrey S. / Hart, George F. /

Conference- Fifth Conference on Geopressed-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 303, 8 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Figure (6) /

Ref.

Descriptor(s)- / Geochemical surveys / Geochemistry / Hydrocarbons / Louisiana / Observation wells / Potential energy / Reservoir properties / Well characteristics /

Abstract by GGIS

This project was set up to study the hydrocarbon source potential of the Sweet Lake geopressed test well, and to enhance the existing information from which future geochemical interpretations of geopressed wells will be made. In order to develop a methane gas prediction equation for geopressed wells, hydrocarbon production data must be related to the geochemical and thermal maturation data. From the 314 samples given organic geochemical analysis, the source characteristics and prospective oil and gas yield has been estimated.

720. GGIS-100002/O/ / / 3/A/ / / / /

Title- Origin and Maintenance of Abnormal Pressures

Author(s)- / Loudon, Lester R. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

Geopressured Geothermal Bibliography

USA

Publication date- Vol. 3 , 1972

Pagination- Page 23 , 5 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Engineering geology / Geopressured reservoirs /
Overburden pressure / Basins / Pressure buildup / Geopressure /
Origin / Traps / Tectonics / Models /

721. GGIS-100054/J/ / /A/ / / / /

**Title- Origin of Abnormal Formatin Pressures in Central North Sea
Lower Tertiary Clastics**

Author(s)- / Carstens , H. /

Publication date- Vol. 19 , Issue 2 , 1978

Pagination- Page 24 , 7 Pages

Descriptor(s)- / Clastic rocks / Geopressure / Geopressured
reservoirs / North Sea / Sealing / Sediments / Tertiary Period /

Abstract by TIC

The existence of definite seals bounding an abnormally pressured formation in Central North Sea Lower Tertiary argillaceous sediments is questioned. The hypothesis submitted favors a self-sealing mechanism, provided by four major factors; high clay content, dominance of swelling clays, discontinuous limestone stringers, and gas.

722. GGIS-100351/R/ / /M/ / / / /

Title- Osmotic Model to Explain Anomalous Heads

Author(s)- / Marine , I. W. / Fritz , S. J. /

Publication date- 1978

Pagination- 30 Pages

Report/patent- DP-MS-78-43

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U.S. Department of Energy

EY-76-C-09-0001 /

Corporate Author- Du Pont de Nemours (E. I.) and Co.

Savannah River Lab.

Aiken , South Carolina , USA

Auxiliary expression(s)-

Illus. / Figure (7) /

Table

Descriptor(s)- / Aqueous solutions / Aquifers / Chemical composition
/ Clay / Compaction / Geochemistry / Geopressured reservoirs /
Ground water / Hydrology / Ions / Osmosis / South Carolina /
Wells /

Abstract by TIC

Laboratory experiments showed that compacted clays act as osmotic membranes when they separate aqueous solutions of unequal ionic concentration. Osmotically induced differential water pressure in ground water systems can be relatively high. The magnitude depends primarily upon concentration differences

across the membrane and type of ions as well as upon the type of clay and its degree of compaction. In experiments, thin, compacted clay membranes commonly exhibit low osmotic efficiencies due to ion leakage through the clay. In natural systems, the membrane and solution containers are not as distinct and well defined as they are in the laboratory. In addition, the membrane is commonly thick, inhomogeneous, and composite. Higher osmotic efficiencies in natural systems may arise as a result of ion leakage being impeded by relatively thick membrane systems. In a buried Triassic Basin at the Savannah River Plant near Aiken, South Carolina, it is suspected that osmosis causes the saline water in the basin center to be slightly geopressured in relation to fresh water in the overlying Coastal Plain aquifer. Two wells have different heads of 7.88 and 12.98 bars (114.3 and 188.3 psi) above the head in the Coastal Plain aquifer. The head in each of these wells approximates the osmotic equilibrium head calculated from solution concentration of water produced by each well (12,000 and 18,500 mg/L, respectively). Other wells penetrating the very top and edge of the Triassic Basin probably penetrate a zone where ion leakage gives rise to less saline water. Thus, these wells are not geopressurized.

723. GGIS-100236/J/ / /A/ / / / /

Title- Osmotic Model to Explain Anomalous Hydraulic Heads

Author(s)- / Marine, I.W. / Fritz, S.J. /

Publication date- Vol. 17, Issue 1, February 1981

Pagination- Page 73, 10 Pages

Auxiliary expression(s)-

Illus. / Figure (8) /

Table

Ref.

Descriptor(s)- / Basins / Geopressure anomalies / Geopressured zones / Osmosis / Permeability / Rock properties / Salt water / South Carolina / Triassic Period /

Abstract by WRA

In a buried Triassic basin near the Savannah River, South Carolina, saline water in the basin center is slightly geopressurized with respect to fresh water in the overlying coastal plain aquifer. Two wells have heads of 7.88 and 12.98 bars (114.3 and 188.3 psi) greater than the coastal plain aquifer head. The head in each of these wells approximated the osmotic equilibrium head, calculated from the solution concentration of water produced by each well (12,000 and 18,500 mg per liter, respectively). Other non-geopressured wells in the top and edge of the basin probably penetrate a zone where ion leakage produces less saline water. Although compacted clays act as osmotic membranes when they separate solutions of unequal ion concentrations, in natural systems both membranes and solution containers are indistinct and not well defined. In addition, the membranes are thick, inhomogeneous, and composite. The authors explain the anomalous heads in this basin as follows; previous hydrogeochemical processes produced the saline groundwater, and fresh water passed into the Triassic rock by osmosis until equilibrium was reached. The freshwater influx decreases the

salinity of water in the margins of the basin, lowering osmotic pressure and isolating an osmotic cell in the center of the basin. The cell will "run down" as fresh water moves inward and salt leaks outward, depending on the rate of movement and total supply of salt in the rocks.

724. GGIS-100258/O/ / /A/ / / / /

Title- Overpressure Detection and Control at IMP Immerk B-48 Using a Wellsite Mud Gas Detector

Author(s)- / Daw , R. N. / Myers , D. L. / Mercer , R. F. /

Conference- SPWLA Annual Logging Symposium

New Orleans

Louisiana

USA (June 4 , 1975)

Publication date- Vol. 16 , 1975

Pagination- 15 Pages

Descriptor(s)- / Petrophysical methods / Petroleum equipment /
Natural gas exploration / MacKenzie District / Well testing /
Reservoir studies / Detection / Equipment / Geopressure /
Geopressure exploration / Natural gas / Pressure control /
Testing /

Abstract by TIC

Continuous mud gas detection was used at Imp Immerk B-48 in the Mackenzie Delta during drilling operations to assist in the detection and control of overpressure due to undercompaction of fine-grained sediments. Special techniques used in conjunction with the gas detector data improved the ability to relate the increase in formation pore pressure to the required mud weight as drilling proceeded. Careful interpretation of the mud gas response to the drilling actions showed a repetitive cycle of events. Knowing the cause of these repetitive cycles and recognizing current position in the cycle increase drilling safety by providing better control of mud weight.

725. GGIS-100058/J/ / /A/ / / / /

Title- Overpressured Formations--1

Subtitle- Occurrence and Significance of Abnormal-Pressure Formations

Author(s)- / Fertl , Walter H. / Timko , Donald J. /

Publication date- Vol. 68 , Issue 1 , January 5 , 1970

Pagination- Page 97 , 6 Pages

Auxiliary expression(s)-

Illus. / Figure (4) /

Table

Ref.

Descriptor(s)- / Clay minerals / Compaction / Geopressured zones /
Gulf Coast / Illite / Montmorillonite / Osmosis / Permeability /
Pore pressure / Porosity / Reservoir pressure / Reservoir
properties / Reservoir temperature / Salinity / Shale / Well
drilling /

Abstract by Author (rev.)

Formation pressures higher than hydrostatic occur worldwide and are important factors in the successful planning of drilling programs. Many techniques are used in the industry to detect and evaluate these zones and an understanding of their occurrence and detection is necessary to make the best of modern drilling techniques, reduce blowout hazards, and provide the most effective completion. Changes in the properties of shales can be used to detect overpressured formations. These include in-place or surface measurements of shale resistivity, sonic travel time, bulk density, clay mineral abundance ratio, and salinity changes. In addition, borehole temperature and rate of penetration are used to detect overpressures. Increasing exploratory efforts in new areas on and offshore, and the general trend to deeper drilling will broaden the areas of overpressures which are accompanied by associated drilling and production problems. Therefore, in this first article of a two part series, the authors examine the geologic significance, clay mineral properties, shale factors, pressure and permeability, and temperature characteristics of overpressured formations as an aid in the detection and evaluation of these zones.

726. GGIS-100058/J/ / /A/ / / / /

Title- Overpressured Formations--2

Subtitle- How Abnormal-Pressure-Detection Techniques are Applied

Author(s)- / Fertl , W.H. / Timko , D.J. /

Publication date- Vol. 68 , Issue 2 , January 12 , 1970

Pagination- Page 62 , 6 Pages

Auxiliary expression(s)-

Illus. / Figure (10) /

Ref.

Descriptor(s)- / Bottom hole temperature / Density / Drilling /
Geopressed reservoirs / Neutron logging / Penetration rate /
Resistivity logging / Salinity / Thermal conductivity /

Abstract by Compendex

The best approach in detecting and evaluating geopressures is to study a combination of several measured properties of the formation, i.e., bulk density, conductivity, resistivity as well as neutron measurements. Salinity variations, drill penetration rate, borehole temperature, and presence of gas in mud supply are also indices for determination of abnormal geopressures.

727. GGIS-100023/J/ / /A/ / / / /

Title- Overpressured Shale Masses and Growth Faulting, New Tectonic Style in Cretaceous Foreland Basin, Colorado

Author(s)- / Weimer , R.J. / Davis , T.L. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 60 , Issue 8 , 1976

Pagination- Page 1413 , 2 Pages

Descriptor(s)- / Colorado / Cretaceous period / Geopressure / Growth faults / Oil shale / Shale / Tectonics /

728. GGIS-100241/O/ / /A/ / / / /

Title- Overview of the California Permitting Process

Author(s)- / Trower , E. D. /

Conference- Geothermal Resources Development Institute Conference

Salt Lake City

Utah

USA (January 27 , 1977)

Publisher- Rocky Mountain Mineral Law Foundation

Boulder, CO

Publication date- January 27 , 1977

Pagination- 27 Pages

Report/patent- CONF-770135--

Descriptor(s)- / California / Geothermal exploration / Geothermal resources / Licensing / Regulations /

Abstract by TIC

During the more than fifteen years that it has lived with geothermal power production, California has developed, and continues to develop, a sophisticated geothermal regulatory structure. An overview is presented of that structure giving special emphasis to the exploration permitting process. The newly enacted Napa County Geothermal Ordinance is a focal point for discussion of the substantial powers that California has delegated to local units of state government. (MHR)

729. GGIS-100528/O/ / /A/ / / / /

Title- Overview of Drilling and Completion Practices in Geopressured-Geothermal Wells

Author(s)- / Eaton , Ben A. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 29 , 3 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy

DE-AC08-80ET27081 /

Auxiliary expression(s)-

Illus. / Diagram (2) /

Descriptor(s)- / Geopressured wells / Geothermal wells / Recovery processes / Well completion / Well drilling / Wells of opportunity /

Abstract by GGIS

Eaton Industries, Inc. has drawn on its experience with oil and gas drilling practices for working with the DOE's Wells of Opportunity program. Differences from oil and gas well completion and special procedures required by geopressured geothermal well completion are discussed in this paper. Measures for cost control and efficient operations in drilling and completing test wells also are discussed.

730. GGIS-100254/R/ / /M/ / / / /

Title- Overview of Geothermal Technology

Author(s)- / Howard , J. H. /

Conference- Geothermal Seminar

Sacramento

California

USA (May 9 , 1978)

Publication date- May 1978

Pagination- 47 Pages

Report/patent- LBL-7048

Corporate Author- California University, Berkeley

Lawrence Berkeley Laboratories

Berkeley , California , USA

Descriptor(s)- / Energy source development / Geothermal resources /
Power generation / Technology assessment / Waste disposal /

Abstract by TIC

The technology of geothermal resource development includes the technologies associated with finding the resource, defining it well enough to invest in its development, plumbing it to move the heat from the earth to where it will be used, using it, and finally disposing of it. The base of earth sciences experience needed to adequately project limited data so as to discover and define a geothermal resource is growing rapidly as new resources are developed and elucidated. Technologies for moving the fluid are improving as new challenges are faced, e. g., the development of downhole pumps in order to increase flow rates from costly wells. Although a wide variety of applications of geothermal resources exist, still to be evaluated commercially are the use of binary cycles in electric power production and the possibility of using geothermal energy in the production of heavy water and in sugar milling and refining. Disposal of spent geothermal fluid underground (in contrast to surface disposal) is receiving increasing favor, both because of its greater acceptability from an environmental point of view and because of its beneficial effects on minimizing subsidence and recovering additional heat stored in rock framework of a geothermal reservoir.

731. GGIS-100495/R/ / /M/ / / / /

**Title- Overview of Research and Development Activities in
Unconventional Natural Gas Recovery**

Publication date- August 1978

Pagination- 41 Pages

Report/patent- PB80-219181

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRI-5010-380-0055 /

Corporate Author- Booz, Allen and Hamilton, Inc.

Bethesda , MD , USA

Geopressured Geothermal Bibliography

Descriptor(s)- / Aquifers / Coal deposits / Geopressured reservoirs /
Industry / Methane / Natural government / Natural gas / Research
programs / Sand / Shale / USA /
Abstract by NTIS

The purpose of this report is to provide an overview of research activities related to production of natural gas from unconventional sources. The overview discusses government and industry research activities in the four areas of unconventional gas-- western tight sands, Devonian shale, coal seams, and geopressured aquifers.

732. GGIS-100522/R/ / /M/ / / / /

Title- Overview of Unconventional Natural Gas Research and Development Activities

Publication date- September 1980

Pagination- 224 Pages

Report/patent- PB80-227986

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Gas Research Inst., Chicago, IL /

Corporate Author- Science Applications, Inc.

Energy Utilization Group

McLean, VA

Descriptor(s)- / Brines / Coal deposits / Commercialization /
Constraints / Energy source development / Geopressured
reservoirs / Geothermal fluids / Methane / Natural gas / Research
programs / Sand / Shale / USA /

Abstract by NTIS

This overview report is organized into four major sections. Section 1, the Executive Summary, provides the essential findings of the overall report. Section 2, Trends in Unconventional Natural Gas Production, provides a relative perspective of the resources, production history, and future role in the U.S. gas supply of the unconventional gas sources. Section 3, Unconventional Gas Sources, includes five subsections relating to each of the four major unconventional gas sources: 3.1 Western Tight Gas Sands, 3.2 Eastern Devonian Gas Shales, 3.3 Methane from Coalbeds, 3.4 Geopressured Brines, and 3.5 Other Unconventional Natural Gas Sources. Each subsection provides a brief description of the resources involved, a review of the major RD&D activities, identification of major constraints to commercialization, and a list of technical problems needed to be addressed by additional research work.

733. GGIS-100528/O/ / /A/ / / / /

Title- Parametric Study of Separator Performance

(Addendum)

Author(s)- / Hayden, Christopher G. / Randolph, Philip L. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- 14 Pages
 Local Availability- GGIS
 Local Availability- CES
 Sponsor- / Department of Energy, Washington, D.C. (USA)
 DE-AC08-80ET27081 /
 Auxiliary expression(s)-
 Illus. / Graph (15) /
 Table
 Ref.
 Descriptor(s)- / Data analysis / Fluid properties / Reservoir fluids /
 Well testing / Wells of opportunity /
 Abstract by GGIS

A test consisting of combining gas and brine flow-rate data with analyses of gas and brine samples simultaneously collected was performed to study the operating characteristics of the separator use on tests of the HO&M Prairie Canal Co., Inc., Well No. 1. The sample collection and analysis procedure was implemented for a wide range of separator pressures. Details of the flow test and a presentation and interpretation of the data obtained are reviewed.

 734. GGIS-100393/0/ / /A/ / / / /

Title- Part I: The Abbeville Area

Author(s)- / Paine , William R. / Kinsland , Gary L. / Duhon , Michael P. / Dungan , James R. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1160 , 40 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

ET-78-S-05-6064 /

Corporate Author- Southwestern Louisiana Univ.

Lafayette , USA

Auxiliary expression(s)-

Illus. / Diagram (4) / Map (15) / Figure (5) /

Table

Ref.

Descriptor(s)- / Areal geology / Exploration methods / Geopressured reservoirs / Louisiana / Maps / Methane / Moderate temperature / Permeability / Porosity / Pressure / Reservoir description / Reservoir properties / Resource assessment / Salinity / Sand / Seismic surveys / Subsurface mapping / Vermillion Parish /

Abstract by Author

The structure investigated is a basin which is roughly bounded by the Abbeville Dome on the west, the Erath Dome on the southeast, and the Grosse Isle Dome on the northeast and whose center is located at approximately Section 31 T14S R4E. The geopressured sands investigated are below approximately 12,800 ft (3901 m) in

the center of the basin and consist of two groups of rather thin, discontinuous, marly sands. These two groups, rather arbitrarily defined, are termed the upper and lower geopressured sands, and the following map types and analyses have been derived from subsurface data of each: structure, temperature, pressure, salinity, and net sand maps; and porosity, permeability, and methane content analyses. Seismic data proved to be very important in the evaluation of this prospect. Well control data proved to be very important in the evaluation of this prospect. Well control is sparse within the basin but quite adequate on the surrounding domes. Four CDP seismic lines were purchased and reprocessed, and structural maps from four horizons were prepared from them. These maps confirmed that the major faults found over the domes do in fact extend into the basin. The general basin structure and shape are also confirmed, as is the shape of an unconformity surface which appears to mark the top of geopressure in the area. Perhaps the most important result of the seismic data is the proof that the rocks below the unconformity, i.e., in the geopressured region of interest, are highly and complexly faulted. An indication that this might be the case can be seen over the Grosse Isle structure where sufficient well control penetrates the uplifted unconformity to establish copious faulting; however, in the basin itself the seismic data were necessary to establish the degree of faulting.

735. GGIS-100429/R/ / /M/ / / / /

Title- Performance of a Total-Flow Impulse Turbine for Geothermal Application

Author(s)- / Comfort, W. J., III /

Conference- 12th Intersociety Energy Conversion Engr. Conf.

Washington

DC

USA (August 28 , 1977)

Publication date- May 16 , 1977

Pagination- 6 Pages

Report/patent- UCRL-79325

Note- Preprint

Available- Lawrence Livermore Laboratory

University of California

Livermore

CA

94550

(Paper copy)

Local Availability- CES

Sponsor- / Energy Research and Development Administration,

Washington, D.C. (USA)

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Livermore Lab.

Livermore, USA

Auxiliary expression(s)-

Illus. / Photo (5) / Graph (2) /

Table

Ref.

Descriptor(s)- / Efficiency / Geothermal brines / Geothermal energy conversion / Laboratory testing / Mathematical models / Performance testing / Total flow systems / Turbines /

Abstract by Author

A new, axial-flow impulse turbine was tested at LLL as part of the geothermal energy development program. Engine efficiency of this single-stage, two-phase expander was measured at 23% during a single-nozzle test. Performance predictions of a numerical model agreed with these results. Full-admission performance (based on the numerical-model and attainable nozzle thrust coefficients) indicates that engine efficiency can reach between 38 and 40% with present technology. Improved techniques for analyzing two-phase flow and further reduction of droplet sizes should provide 70% engine efficiency.

736. GGIS-100999/O/ / /A/ / / / /

Title- Performance of a 10 MW Geothermal Energy Conversion Test Facility

Author(s)- / Jacobson , William O. /

Conference- 13th Intersociety Energy Conversion Engineering Conference

Pagination- Page 1074 , 3 Pages

Report/patent- SAE--789232

Auxiliary expression(s)-

Illus. / Diagram (1) /
Table

Descriptor(s)- / Binary fluid system / Electric power / Flashed steam systems / Geothermal brines / Geothermal energy conversion / Performance / Scaling /

Abstract by Author

The performance of San Diego Gas and Electric's Geothermal Loop Facility has been generally good. Comparison of initial flash/binary conversion cycle selection criteria to performance data has led to renewed interest in a flash cycle. Brine system performance has been generally successful but hampered by scale accumulation. Improved scale removal and control techniques are being evaluated. Geothermal steam and condensate systems have shown good steady state performance, but performance is adversely affected by upsets or oscillations. Operation of the binary system, originally designed for isobutane, with water as the working fluid has been off design, but no performance problems are expected if design conditions are approached.

737. GGIS-100393/O/ / /A/ / / / /

Title- Perspectives on Geopressured Resources Within the Geothermal Program

Author(s)- / DiBona , Bennie /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 1 , June 1980

Pagination- Page 219 , 16 Pages

Available- Center for Energy Studies

University of Texas at Austin

Geopressured Geothermal Bibliography

ENS. 143
Austin
TX
78712
(Paper copy)
Local Availability- CES
Corporate Author- Department of Energy
Div. of Geothermal Energy
Washington , DC , USA
Auxiliary expression(s)-
Illus. / Graph (1) / Map (1) /
Table
Descriptor(s)- / Energy source development / Direct energy
utilization / Energy policy / Exploitation / Geopressure
resources / Geothermal drilling / Power generation / Research
programs / Resource assessment / Uses /
Abstract by Author
This paper reviews the potential of geothermal energy in the
United States. Current sources of and uses for geothermal energy
are described. The paper outlines how geopressured resources
fit into the geothermal program of the Department of Energy
(DOE). Description of the program status includes progress in
drilling and assessing geopressured resources.

738. GGIS-100122/B/ / /M/ / / / /

Title- Petroleum from the Deposits of the Soviet Union
(Physical Chemical Properties of Petroleum, Brief Descriptions
of Oil and Gas Fields)
Original Title- Nefti Mestorozhdeniy Sovetskogo Soyuz
Author(s)- / Trebin , G. F. / Charygin , N. V. / Obukhova , T. M. /
Publisher- IZD. Nedra
Moscow, USSR
Publication date- 1974
Pagination- 423 Pages
Language- Russian
Auxiliary expression(s)-
Illus.
Descriptor(s)- / USSR / Economic geology / Petroleum / Natural gas /
Oil and gas fields / Regional / Deposits / Physical properties /
Chemical composition / Viscosity / Geopressure / Temperature /
Density / Thermal properties / Reservoir rocks / Gases /
Abundance / Saturation pressure /

739. GGIS-100092/ / / /M/ / / / /

**Title- Phase 0 Resource Management and Scope-of-Work Study for
Generation of Electric Power**
(3/75 to 11/75)
Subtitle- Gulf Coast Geopressured Geothermal Resource
Author(s)- / Dorfman , M. H. /
Publication date- 1975
Note- Estimated Calendar Year Funding Reported as 1975 \$318,000
Available- University of Texas, School of Engineering

University of Texas
 School of Engineering, Petroleum Engineering
 200 W. 21ST
 Austin, Texas 78712

Corporate Author- U.S. National Science Foundation
 Abstract by Energyline

The objectives of this research are to establish boundaries and criteria for the viable utilization of Gulf Coast geopressured geothermal resources and to develop preliminary plans and cost estimates for a geopressured resource test facility. The project is broken down into four discrete areas of endeavor: resource assessment; advanced research and technology; legal, institutional, and environmental; and resource utilization. Integral to the research is the inclusion of electric utilities, industrial companies, energy companies, potential user groups, and state, and local governmental agencies. The research effort will culminate in a geopressured geothermal symposium to insure the rapid transfer of research and technology to user groups in an effort to establish the viability of geopressured geothermal resources as quickly and as efficiently as possible.

740. GGIS-100365/R/ / /M/ / / / /

Title- Phase 1 Report:

Subtitle- Investigation of Geothermal Energy Information Sources

Publication date- July 14 , 1976

Pagination- 86 Pages

Report/patent- DGE-2359-T1

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U. S. Energy Research and Development Administration
 E(49-18)-2359 /

Corporate Author- Franklin Inst. Research Labs.
 Science Information Services Dept.

Rockville , Maryland , USA

Descriptor(s)- / Document types / Geothermal energy / Information systems /

Abstract by Author

To provide a base for ERDA geothermal energy information activities, the Science Information Services Department (SIS) of the Franklin Institute Research Laboratories engaged in a geothermal literature survey. The activity consists of two discrete phases: Phase 1, Investigate Available Information Services; and Phase 2, Design Information Dissemination Tools. In this report the results of Phase 1 activities are presented. The initial task under Phase 1 was the development of a subject screening list which would be used by acquisitions specialists as a guide to the orientation of pertinent literature. The subject screening list was derived primarily from the geothermal subset of the ERDA Energy Thesaurus and from the ERDA Energy Information Data Base Subject Categories. Removed from those sources were terms not pertinent to geothermal energy, and added were relevant terms and concepts not covered. Subsequent to

Geopressured Geothermal Bibliography

preparation of the subject screening list, a core list of serial publications containing geothermal energy information was generated by SIS library scientists. This list was correlated with the ERDA-TIC serial publications list to produce a list of serial titles not currently available to ERDA-TIC. Included in both lists is an estimate of the annual geothermal information yield of the serial sources. In Section 4 is presented a listing of sources of geothermal energy information other than serial publications and in Section 5 the conclusions, including methods of acquisition to be utilized and the estimated annual volume of information from all sources is presented.

741. GGIS-100528/O/ / /A/ / / / /

Title- Pilot Unit Testing of Scale Inhibitors at Geopressured Energy Well Sites

Author(s)- / Mouche , R.J. / Matson , M.L. / Matson , J.V. /
Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 341 , 3 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-80ET-27217 /

Auxiliary expression(s)-

Illus. / Figure (1) /

Descriptor(s)- / Corrosion protection / Functional models /
Geothermal wells / Scaling control / Testing / Wells /

Abstract by Author

The skid-mounted pilot unit is a smaller version of the main surface equipment used at geothermal geopressured well sites. It will be used to monitor the effectiveness of scale and corrosion in the main surface equipment. The pilot unit will model the main surface equipment with respect to pressure, flow velocities, and scale inhibitor injection. The pilot unit will also operate under other conditions for optimization determination. Scaling tendencies will be monitored by specially shaped mild steel coupons placed at critical locations throughout the pilot unit. The coupons will be checked at regular intervals, and analysis will include visual, weight and EDAX-SEM analysis. Various scale inhibitors will be tested over a large range of dosage levels in order to screen inhibitors and their effectiveness for water with particular quality parameters.

742. GGIS-100407/O/ / /A/ / / / /

Title- Pipeline Sizing and Selection

Author(s)- / Little , Nathan H. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)
 Publisher- Geothermal Resources Council
 Davis, CA
 Publication date- Vol. 4 , 1980
 Pagination- Page 641 , 4 Pages
 Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasei W. Roberts
 Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 CA
 95616
 Local Availability- GGIS
 Auxiliary expression(s)-
 Illus. / Graph (4) /
 Table
 Ref.

Descriptor(s)- / Capital / Comparative evaluations / Corrosion
 protection / Cost / Design / District heating / Economic analysis
 / Graphs / Idaho / Income / Materials testing / Optimization /
 Pipelines / Pipes / Pumping / Specifications / Thermal
 conductivity / Thermal insulation /

Abstract by GGIS

Discussion of an economic model used to determine optimum pipe size for a pipeline network in a geothermal district heating system is presented in this paper. Using the economic model allows the discounted present worth of the system to be minimized. The total costs of the system cover three areas: materials and installation costs; heat loss costs; and pumping costs. Cost information is plotted such that declining costs (pumping) and increasing costs (materials and heat loss for a given insulation thickness) are shown as a function of pipeline diameter. The sum of these costs gives the relative total pipeline cost from which the optimum pipeline size can be determined.

 743. GGIS-100262/R/ / /M/ / / / /

Title- Plan for the Long Term Environmental Assessment of
 Geopressured Resource Development in the Louisiana Gulf
 Region.

Author(s)- / Newchurch , E.J. / Bryan , C.F. / Harrison , D.P. /
 Muller , R.A. / Wilcox , R.E. / Bachman , A.L. / Newman , J.P.
 / Cunningham , K.J. / Hilding , R.K. / Rehage , J.L. /

Publication date- June 15 , 1978

Pagination- 319 Pages

Report/patent- UCRL--13913

Available- NTIS

(Paper Copy)

(Microfiche)

Corporate Author- Louisiana State Univ., Baton Rouge

Inst. for Environmental Studies

Baton Rouge , Louisiana , USA

Descriptor(s)- / Air quality / Ecosystems / Environmental effects /
 Geology / Geopressure resources / Gulf Coast / Louisiana /

Geopressured Geothermal Bibliography

Planning / Regional analysis / Resource assessment / Social impact / Socio-economic factors / Water quality /
Abstract by TIC

Results of research to develop a plan for the long-term environmental assessment of geopressured/ geothermal resource development in the Louisiana Gulf Coast region are reported. An overall view of the environmental issues facing decision-makers in the area of geopressured resource development is presented, along with a plan for monitoring potential environmental impacts. Separate assessments and plans are presented for geological effects, air and water quality, ecosystem quality, and socioeconomic and cultural considerations.

744. GGIS-100450/R/ / /M/ // //

Title- Planning and Design of Additional East Mesa Geothermal Test Facilities (Phase 1B)

Subtitle- Volume 1--Final Report

Author(s)- / Pearson , R.O. /

Publication date- Vol. 1 , October 1976

Pagination- 87 Pages

Report/patent- SAN/1140-1/1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Energy Research and Development Administration,
Washington, D.C. (USA). Div. of Geothermal Energy
E(04-3)-1140 /

Corporate Author- TRW Defense and Space Systems Group
Systems Engineering and Integration Div.
Redondo Beach , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (9) / Graph (12) / Map (13) /
Table

Descriptor(s)- / Computerized simulation / Cost / Design / East Mesa
KGRA / Evaluation / Field studies / Geothermal wells / Injection
/ Planning / Production wells / Test facilities /

Abstract by Author

This project focused on the planning and design of additions to the ERDA East Mesa Geothermal Component Test Facility. This project is supplemental to the U.S. Bureau of Reclamation Phase 1A project which expanded their water desalination operations with ERDA funding to accommodate limited-scale geothermal component testing. The Phase 1B designs developed in this project completes the Phase 1 implementation plan designs recommended by TRW in 1974 under National Science Foundation Grant No. G1-44149. When construction is completed to the designs reported herein, the ERDA East Mesa Geothermal Component Test Facility, as shown in Figure 1-1, (Section 1 of this report) will provide moderate temperature/low salinity fluid to facilitate comprehensive testing of conversion systems and components developed by industry, universities and other agencies under realistic field conditions. The project objectives included (1) development of designs of new wells and modifications to existing wells to improve definitive reservoir

evaluations and (2) design of additional test facilities integrated with the limited-scale Phase 1A facilities to accommodate diverse commercial utilization technology experiments. A reservoir utilization evaluation was conducted to establish locations and design drilling programs for three new wells and modifications to existing wells to improve reservoir definition and provide a comprehensive inventory of geothermal well fluids for testing. Ten test facility additions were developed as individual procurement packages of specifications and drawings to facilitate near term construction activation.

745. GGIS-100066/J/ /18105/A/ / / / /

Title- Planning and Drilling Abnormally Pressured Wildcats

Author(s)- / Goldsmith , R. G. /

Journal- World Oil

Publication date- Vol. 181 , Issue 5 , October 1975

Pagination- Page 56 , 4 Pages

Descriptor(s)- / Data / Design / Drilling fluids / Drilling rigs / Engineering / Exploration / Geology / Geopressured systems / Oil wells / Personnel / Petroleum / Planning / Pressure dependence / Safety / Well drilling /

Abstract by GGIS

To safely drill abnormally pressured formations requires coordinated collection, presentation and interpretation of data in order to decide the mud weight to be used, logs to be run, and when casing should be set. For development wells this can be planned by correlating data from other wells. However, in the case of wildcats, where there are no wellswells for correlation, the well plan must be developed as the well is drilled. Thus the key to planning and drilling an abnormally pressured wildcat is to have the proper personnel at the drilling site and the company office. The planning and drilling decisions made for such a well by onsite drilling supervisors and an engineer, and a drilling supervisor and engineer in the office are discussed. It is found that it is mandatory to have one well-trained project coordinator at the rig and one at the office. With supervisors trained in the basics of pressure control theory, and equipped with modern logging-drilling data analysis units, a drilling engineer or other specialist(s) on location is not always required.

746. GGIS-100528/O/ / /A/ / / / /

Title- Pleasant Bayou No. 2

Subtitle- A Review of Rationale, Ongoing Research and Preliminary Test Results

Author(s)- / Morton , Robert A. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 55 , 3 Pages

Local Availability- GGIS

Geopressured Geothermal Bibliography

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-79ET27111 /

Auxiliary expression(s)-

Illus. / Map (2) /

Table

Descriptor(s)- / Data compilation / Drilling / Evaluation / Fluid flow
/ Fluid pressure / Geopressured reservoirs / Gulf Coast /
Resource depletion / Well logging /

Abstract by Author

The first well designed and drilled to evaluate Gulf Coast geopressured geothermal energy resources was completed in 1979. Since then, the well has entered a long term production phase intended to provide data on pressure and fluid behavior and reservoir life. Preliminary results indicate that the producing reservoir has good permeability, is extensive, and meets most of the criteria and subsurface conditions predicted prior to drilling, with one exception; salinity is twice what was expected and consequently, methane solubility is about 25 percent lower than expected. Extensive logging and coring and injection activities have provided a wealth of data for ongoing research in areas of geological resource assessment, sandstone diagenesis, rock mechanics, reservoir engineering, chemical analysis of produced fluids, scaling and corrosion of equipment, disposal of spent brines, environmental considerations, economics, and commercial development of the resource.

747. GGIS-100301/J/ / /A/ / / / /

Title- Popping the Cork on Natural Gas

Author(s)- / Adams , James Ring /

Journal- Wall St. J.

Publication date- Vol. 63 , Issue 105 , May 30 , 1979

Pagination- Page 24 , 1 Pages

Local Availability- PCL

Descriptor(s)- / Blowouts / Brazoria County / Geopressured wells /
Heat extraction / Louisiana / Methane / Power generation / Texas
/ Well drilling /

Abstract by Author (rev.)

Hydro-geologist Paul Hastings Jones contends that the research at the Brazoria County geopressure-geothermal test well should concentrate on methane extraction rather than on geothermal energy for power generation. A recently released report for the Federal Energy Regulatory Commission puts the recoverable water-dissolved methane in Louisiana alone at 163 trillion cubic feet, equal to some 80% of the present proved natural gas reserve in the entire U.S. Jones suggests that this estimate be tested by drilling geopressured wells in the following manner: After tapping the geopressured zone, flow the well wide open at up to three times its maximum designed capacity. This would cause a sharp drop in reservoir pressure at the borehole. With this sudden change, natural gas would bubble out of solution. If the pressure were manipulated to "milk" the gas from the water in this fashion, the well would flow less steam and more methane and eventually form a gas cap that could be tapped much like a natural gas well. This theory is opposed by petroleum engineers,

who fear serious damage to well casings and drilling equipment caused by blowouts. Others contend that most sandstone formations are too lacking in pore space, and too cut throughout with thin layers of shale to allow the migration of gas bubbles that would form a gas cap. And Department of Energy experts are reluctant to test the Brazoria well in this manner because, should Jones' theory fail, the temperature of the water produced by the well would be lowered so much that it would be useless as geothermal energy.

748. GGIS-100364/R/ / /M/ // //

**Title- Population Analysis Relative to Geothermal Energy Development
Imperial County, California**

Author(s)- / Pick , J. B. / Jung , T. H. / Butler , E. /

Publication date- January 1977

Pagination- 119 Pages

Report/patent- DLRI-16

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / National Science Foundation

AER 75-08793 /

Auxiliary expression(s)-

Illus. / Figure (11) /

Table

Ref.

Descriptor(s)- / California / Data analysis / Energy source
development / Employment / Forecasting / Geothermal energy /
Geothermal power plants / Human populations / Imperial County /
Rural populations / Socio-economic factors / Urban populations /

Abstract by Author

This report intends to examine the historical and current population characteristics of Imperial County, California. These include such features as vital rates, urbanization, town sizes, labor force composition, income, utility usage, and ethnic composition. From this basic data inferences are drawn on some of the important social and economic processes. Multivariate statistical analysis is used to study present relationships between variables. Another intent of the report is to speculate on the adaptation or range of adaptations that the county's population will follow, as geothermal plant capacity is scaled up. To accomplish the above goals this report is divided into nine sections. Section 2 reviews historical studies and past research which relates in methods or results to the present work. Section 3 analyzes population trends for the county as a whole. Subcounty data is analyzed in Section 4 for 1970. Regional trends in characteristics such as ethnic composition, dependency ratio, and mobility are studied, and compared with each other for energy development implications. Section 5 investigates characteristics which distinguish enumeration districts overlying geothermal fields from those not overlying fields. Section 6 looks at the population of the county's largest ethnic group, Spanish American. In Section 7, two analyses are conducted of county employment--the first

specific for farm labor displacements in relation to plant capacities and the second a regression study of three broad factors affecting regional employment: age eligibility, participation and unemployment. Section 8 performs population projections for the county under historical, standard, and "geothermal" projection assumptions. Section 9 examines the transferability of methods and results to other geothermal regions anticipating energy development. It is shown that many techniques used are transferable to any geothermal area in the United States, with certain alterations in approach to suit local conditions.

749. GGIS-100023/J/ / 6004/A/ // //

Title- Possibility of Abnormally High Fluid Pressures During Folding and Faulting in Eastern West Virginia

Author(s)- / Perry, W. J., JR. /

Publisher- American Association of Petroleum Geologists

Journal- American Association of Petroleum Geologist Bulletin

Publication date- Vol. 60, Issue 4, 1976

Pagination- Page 707

Descriptor(s)- / United States / Structural geology / Deformation / Fractures / East / Origin / Extension / Tectonics / Faults / Folds / Geopressure / Reservoir rocks / Petroleum / Devonian / West Virginia / Field studies / Veins / Calcite / Quartz / Sedimentary rocks / Sandstone / Porosity /

750. GGIS-100899/O/ / /A/ // //

Title- Potential for the Use of Intermediate Temperature Geothermal Heat in Food Processing

Author(s)- / Swink, D.G. /

Conference- 11 Intersociety Energy Conversion Engineering Conference

Pagination- Page 808, 7 Pages

Report/patent- SAE--769140

Auxiliary expression(s)-

Illus. / Figure (4) / Diagram (2) /
Ref.

Descriptor(s)- / Economics / Food processing / Geothermal resources / Moderate temperature / Process heat / Uses /

Abstract by Author

The application of geothermal heat to industrial food processing is dependent upon the requirements of a given process and the quantity and quality of the geothermal heat available. Three major food industries are examined for potential use of intermediate temperature (90 DEG C-175 DEG C) geothermal water. The industries are sugar beet processing, dairy processing and potato dehydration. The sugar beet process is examined from raw beets to refined sugar with dissolution, concentration and final drying as the most important steps adaptable to geothermal heat use. Dairy processes require heat for pasteurization, cheese manufacture and cleaning of processing equipment. There is also a requirement for process refrigeration. This could potentially be supplied by absorption refrigeration employing a geothermal

heat source. Potato dehydration results in four main products: flakes, granules, slices and potato flour. The peeling, blanching and cooking operations can employ intermediate temperature geothermal heat, as can some of the final drying operations. The economics of such uses are studied along with the engineering requirements.

751. GGIS-100080/B/ / /M/ / / / /

Title- Potential for Energy Production from Geothermal Resources

Subtitle- Report of the Subcommittee on Water and Power Resources,
Committee on Interior and Insular Affairs, Ninety-Third
Congress, First Session, December 1973

Publisher- United States of America
Washington, D.C. (USA)

Publication date- December 1973

Pagination- 48 Pages

Corporate Author- U.S. Congress Joint Economic Committee
Washington, D.C., USA

Auxiliary expression(s)- / Table (3) /

Descriptor(s)- / Senate Committee Interior and Insular Affairs /
Geothermal resources / Leasing / Geothermal energy / Geo brine /
Steam / Hot water / Hot dry rock systems / U.S. National
Aeronautics and Space Administration / U.S. National Science
Foundation / U.S. Department of the Interior / U.S. Atomic Energy
Commission / Brines / Dry-steam systems / Environmental effects
/ Forecasting / Geopressured systems / Geothermal exploration /
Hearings / Hot water systems / Legal aspects / Power potential /
Recommendations / USA /

Abstract by NTIS

Findings of an investigation into the potential contribution of geothermal resources towards energy production include: (1) electrical power production from geothermal resources is technically and economically feasible in certain parts of the U. S.; (2) these resources could produce substantial amounts of heat and electric power, especially for regional power supplies; (3) geothermal technologies may offer environmentally acceptable ways of producing energy; (4) available information is inadequate for reliable estimates of the nature and extent of geothermal energy development and the anticipated achievement of technological capabilities; (5) geothermal resources occur in various situations posing widely different technological problems--dry steam, wet steam, hot dry rock, and geopressured brines; (6) lack of a federal leasing program, financing difficulties, and the risk involved in advanced technologies are inhibiting development by private industry; and (7) aggressive governmental leadership is lacking and R&D is sporadic and uncoordinated. Additional findings and issues are presented. (3 tables)

752. GGIS-100407/O/ / /A/ / / / /

Title- Potential for Geothermal Direct Use in the Greenhouse, Lumber, Chemical, and Potato and Onion Processing Industries

Geopressured Geothermal Bibliography

Author(s)- / Bressler , Sandra E. /
Conference- Geothermal Resources Council Annual Meeting (Geothermal
Energy for the Eighties)
Salt Lake City
Utah
USA (September 9 , 1980)
Publisher- Geothermal Resources Council
Davis, CA
Publication date- Vol. 4 , 1980
Pagination- Page 763 , 3 Pages
Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts
Available- Geothermal Resources Council
P.O. Box 98
Davis
CA
95616
Local Availability- GGIS
Auxiliary expression(s)-
Table
Ref.
Descriptor(s)- / Commercialization / Cost / Direct energy utilization
/ Energy demand / Energy sources / Fuels / Geothermal energy /
Industrial plants / Industry / Information / Management /
Planning / Resource development / Site selection / Technology
assessment / Technology utilization /
Abstract by GGIS

Opinions concerning the future use of geothermal energy by industry were sought through a series of interviews with management from four industries. Geothermal energy promoters have identified these industries (the greenhouse, lumber, chemical, and potato and onion processing industries) as being prospective geothermal energy users. Through the interview process, those factors important to management concerning the selection of energy supplies were identified, and some of the barriers to geothermal energy use were suggested. Using this information as a guide, it is possible that geothermal energy promoters will encounter resistance to geothermal energy use in the form of problems associated with introducing an unfamiliar energy source, and problems of overcoming industry bias toward other alternative energy sources. References are given to four reports issued by the Institute that cover this material in further depth.

753. GGIS-100004/0/ / /A/ // //

Title- Potential for Geothermal Energy

Subtitle- Relationships of Regional Sand Distribution to Pressure and Temperature in the Geopressured Frio Formation (Oligocene), South Texas

Author(s)- / Dorfman , M. H. / Sanders , G. B., Jr. /
Conference- Development and Utilization of Geothermal Resources
Publication date- 1975
Pagination- Page 160 , 2 Pages
Descriptor(s)- / Texas / Economic geology / South / United States /
Exploration / Resources / Reservoir rocks / Engineering

properties / Oligocene / Frio Formation / Engineering geology /
 Geopressured reservoirs / Overburden pressure / Thermal waters /
 Distribution / Geopressure / Temperature / Sand / Sandstone /

754. GGIS-100207/R/ / /M/ / / / /

Title- Potential for Heating Western Tree Seedling Greenhouses with Geothermal Energy

Subtitle- Special report

Author(s)- / McDonald , Stephen E. / Austin , Carl F. / Lott , James R. /

Publisher- USDA Forest Service Equipment Development Center
 Missoula, Montana

Publication date- November 1976

Pagination- 19 Pages

Report/patent- NP-22082

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Map (1) / Photo (2) /

Table

Ref.

Descriptor(s)- / Geothermal heating / Geothermal resources /
 Greenhouses / Hot springs / Resource evaluations / Site
 selection / Thermal waters / Waste water /

Abstract by Author (Rev.)

Most U. S. greenhouses are heated with fossil fuels, usually natural gas, which is becoming more expensive. An alternative energy source with high potential is geothermal energy. The technology to apply it to greenhouseing is available; it is compatible with greenhouse heat exchange hardware; and it is abundant in the western U. S. Geothermal resources suitable for greenhouseing are natural springs, deep hot water or steam wells, and waste water from electrical power plants. The use of known resources reduces the risk factors to reliability of the source and its estimated lifespan. Factors influencing greenhouse heating needs are climate, elevation, and quality of the geothermal energy source. Greenhouse sites should be evaluated for suitability, size, availability of labor supply, markets, etc. When considering geothermal energy as an alternative energy source, these steps are recommended: 1) determine the geographic region the greenhouse will serve; 2) tabulate known geothermal resources within region; 3) rank potential locations in terms of geothermal fluid chemistry and location; 4) obtain data on chemistry, flow potential, temperature, and probable lifespan of resources; 5) conduct economic analysis of proposed greenhouse operation using these geothermal sources; compare with optimum fossil fuel economics and long term availability in the region; 6) proceed with project if economically attractive.

755. GGIS-100505/R/ / /M/ / / / /

Title- Potential Barriers to Increased Production of Natural Gas from Unconventional Sources

Author(s)- / Riedel , E. F. / Rotariu , G. A. / Goldberg , A. J. /

Geopressured Geothermal Bibliography

Conference- American Institute of Chemical Engineering Conference

Philadelphia

PA

USA (June 8 , 1980)

Publication date- PNL-SA-8641 , June 1980

Pagination- 14 Pages

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Office of Technology Assessment(U.S. Congress),
Washington, D.C.

AC06-76RL01830

Sponsor- / Department of Energy, Washington, D.C. (USA). Office of
Technology Imp acts

AC06-76RL01830 /

Corporate Author- Batelle Pacific Northwest Labs.

Richland , WA , USA

Descriptor(s)- / Aquifers / Brines / Coal deposits / Energy source
development / Environmental effects / Geopressured reservoirs /
Louisiana / Methane / Natural gas / Sand / Shale / Technology
assessment / Texas / Waste disposal /

Abstract by NTIS

For Western sands, Eastern shales, and coalbed methane, application of environmental controls currently in use in gas field production should result in environmental effects being localized and temporary. Environmental concerns do not appear to represent significant barriers to commercial production of gas from these resources. The principal barrier to commercial production of gas from Western gas sands remains one of gas price. The barrier appears to be disappearing. Lack of adequate geological information for use in selecting potential drill sites appears to be the principal barrier to production of gas from Eastern shales. The legal question of gas ownership and the conflicting interests of coal and gas producers seems to be the principal hurdle that must be overcome before significant quantities of methane from coalbeds will be utilized commercially. For geopressured aquifers, the environmental barriers of subsidence and disposal of produced brine water appear to be major constraints. These are expected to preclude significant production of gas from this resource in the near future. The resource with the largest near-term capability for commercialization appears to be Western gas sands. This resource is estimated to yield 1 to 2 Tcf/year by 1982. It is more difficult to estimate the probable contribution from the next two most likely resources: methane from coal and Eastern gas shales. These resources might be capable of yielding from .01 to 1 Tcf/year by the mid-1980's. Current engineering evidence seems to indicate that no significant quantities of gas will be produced from geopressured aquifers in the foreseeable future. Information from current tests now underway in Texas and Louisiana should permit better evaluation of the long-term viability of this resource.

756. GGIS-100308/O/ / /A/ / / / /

Title- Potential Environmental Concerns Associated with the Development of Geopressured-Geothermal Resources of the United States Gulf Coast

Author(s)- / Gustavson , Thomas C. / McGraw , M.M. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 245 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Texas Univ., Austin

Bureau of Economic Geology

Austin , Texas , USA

Auxiliary expression(s)-

Illus. / Diagram (1) /

Ref.

Descriptor(s)- / Commercialization / Environmental effects / Geopressure power plants / Geopressure resources / Geothermal brines / Ground subsidence / Gulf Coast / Louisiana / Texas / Waste disposal /

Abstract by Author

The commercial development of geothermal resources is described in terms of three location scenarios: production, generation, and disposal facilities that are on coastal lowlands or uplands; these facilities on coastal marshlands or offshore production facilities; and onshore generation and disposal. The ramifications and environmental impacts of these scenarios are explored.

757. GGIS-100039/R/ / 702/A/ // //

Title- Potential Geothermal Energy

Subtitle- Relationships of Regional Sand Distribution to Pressure and Temperature in the Geopressured Frio Formation (Oligocene), South Texas

Author(s)- / Dorfman , M. H. / Sanders , G. B., JR. /

Publisher- Geological Society of America

Publication date- Vol. 7 , Issue 2 , 1975

Pagination- Page 160 , 1 Pages

Descriptor(s)- / Geothermal energy / United States / Texas / South / Resources / Occurrence / Possibilities / P-T conditions / Sand / Distribution effects / Geopressure / Oligocene / Frio Formation / Economic geology /

Abstract by Author

Studies of regional sand distribution of the Frio Formation in South Texas have been augmented by well log evaluations of temperature and pressure in the geopressured intervals, as a first step in evaluation of potential geothermal resources in

Geopressured Geothermal Bibliography

the coastal Texas. The top of the geopressured zone occurs between depths of 7,000 ft. and 12,000 ft. below sea level and shows well defined pressure patterns that can be correlated with sand body geometry and distribution. Isothermal maps of prior intervals show steepening thermal gradients below 225 DEG F (107 DEG C), and a relationship of high-sand areas with lower temperatures. Correlation of physical parameters with sand distribution patterns will lead to selection of prospective areas in the search for geopressured geothermal reservoirs.

758. GGIS-100211/R/

Title- Potential Geothermal Resources in Texas

Subtitle- Technical Memorandum ESL-TM-3

Author(s)- / Dorfman, Myron /

Publication date- December 14, 1973

Pagination- 15 Pages

Report/patent- ESL-TM-3

Note- Presented to Committee on the Energy Crisis, Texas House of Representatives, 14 Dec. 1973

Local Availability- GGIS

Corporate Author- Texas University, Austin

College of Engineering, Engineering Systems Labs

Austin, Texas, USA

Auxiliary expression(s)-

Illus. / Map (1) /

Descriptor(s)- / Cost / Environmental effects / Geothermal energy /

Geothermal resources / Gulf Coast / Rio Grande Rift / Texas /

Trans-Pecos hot rocks /

Abstract by Author (Rev)

Geothermal energy represents a here and now energy source

which, with rapid development, may partially fulfill our energy

requirements. Present technology is sufficiently advanced to

explore for, drill and develop geothermal fields. Costs are

usually less than those encountered for power generation using

other petroleum substitutes or alternatives. Environmental

effects are also less troublesome than those reported using

alternative power sources. Texas contains areas of known and

suspected major reserves of geothermal energy: the Rio Grande

rift system, the Trans-Pecos hot rocks, and the Gulf Coast

geothermal sands. Intensive research and development can lead

to rapid utilization of this resource.

759. GGIS-100096/R/

Title- Potential Geothermal 74-4

Author(s)- / Dorfman, Myron / Kehnle, R. O. /

Publication date- 1974

Corporate Author- Texas University

Austin, Texas, USA

Publication date- 1974

Report/patent- NPL-20391

Corporate Author- Texas University

Bureau of Economic Geology

Austin, Texas, USA

Descriptor(s)- / Cost / Environmental effects / Geologic deposits /
Geopressured systems / Geothermal exploration / Geothermal
resources / Hot springs / Hot dry rock systems / Hot water
systems / Power potential / Texas /

760. GGIS-100042/J/ / /A/ / / / /

Title- Potential Land Subsidence at Geothermal Development Sites

Author(s)- / Finnemore , E.J. /

Publication date- Vol. 5 , Issue 5 , May 1977

Pagination- Page 35 , 5 Pages

Descriptor(s)- / Compaction / Forecasting / Geology / Geopressured
systems / Geothermal fields / Geothermal fluids / Ground
subsidence / Hot dry rock systems / Hot water systems / Magma
systems / Vapor dominated systems /

Abstract by DOE/Recon

Potential severities of five physical subsidence processes for
magma, hot rock, steam, hot water, and geopressured systems are
summarized. Compaction is thought to be the most significant,
possibly followed by fracture closing. Site geology, fluid,
reservoir, and material characteristics are identified as
indicators of subsidence potential. Two methods of subsidence
prediction, analogy and analysis, are discussed.

761. GGIS-100154/O/ / /A/ / / / /

**Title- Potential National Benefits of Geothermal Electrical Energy
Production from Hydrothermal Resources in the West**

Author(s)- / Bloomster , C. H. / Engel , R. L. /

Conference- Intersociety Energy Conversion Engineering Conference
State Line, Nevada (September 12 , 1976)

Publication date- 1976

Pagination- 22 Pages

Report/patent- CONF-760906-4

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES MF

Corporate Author- Battelle Pacific Northwest Labs.

Richland , Washington , USA

Descriptor(s)- / Availability / Comparative evaluations /
Computerized simulation / Cost / Economic analysis / Economics /
Electric power / Electric power generation / Fossil fuels /
Geothermal energy / Geothermal power plants / Geothermal
resources / Hydrothermal systems / Nuclear fuels / Optimization
/ Power generation / Power potential / Public utilities /
Scenarios / USA / Simulation /

Abstract by NTIS

The potential national benefits of geothermal electric
energy development are estimated for several different
scenarios. This analysis uses a computer simulation of the U.S.
electrical economy using a linear programming optimization
technique. Under most of the scenarios, the benefits are
estimated at \$2--\$4 billion over the next 50 years on a

discounted present value basis. The electricity production from hydrothermal plants reaches 2--4 percent of the national total which will represent 10--20 percent of the installed capacity in the West. Installed geothermal capacity in 1990 is estimated to reach 9,000--17,000 MWE. The peak geothermal capacity reaches 28,000--65,000 MWE by year 2015. The most likely scenario yields the lower values in the above ranges. Under this scenario geothermal development would save the utility industry \$11 billion in capital costs (undiscounted); 32 million separative work units; 64,000 tons of U308 and 700 million barrels of oil. The most favorable scenario for geothermal energy occurred when fossil fuel prices were projected to increase at the rate of 5 percent/year. The benefits of geothermal energy then exceeded \$8 billion on a discounted present value basis.

762. GGIS-100106/R/ / /M/ / / / /

Title- Potential Power Generation and Gas Production from Gulf Coast Geopressure Reservoirs

Author(s)- / House , P. A. / Johnson , P. M. / Towse , D. F. /

Publication date- May 27 , 1975

Pagination- 42 Pages

Report/patent- UCRL--51813

Available- NTIS

(Paper copy)

(Microform)

Corporate Author- California Univ.

Lawrence Livermore Laboratories

Livermore , California , USA

Descriptor(s)- / Binary cycles / Cost / Economics / Geopressured systems / Geothermal energy / Geothermal energy conversion / Geothermal power plants / Geothermal resources / Geothermal wells / Gulf of Mexico / Injection wells / Louisiana / Mathematical models / Natural gas / Performance / Power generation / Power potential / Pressure dependence / Systems analysis / Texas / Thermodynamics / Total flow systems / Geological setting / Temperature measurement / Pressure measurement / Chemical composition / Sealing / Fluid flow / Hydraulics / Theoretical treatments / Gas production / Maps / Tables / Diagrams / Geo brine / United States North / Natural gas resources /

Abstract by NTIS

Extensive onshore and offshore geopressured water reservoirs are found in the Texas and Louisiana Gulf Coast region. Energy in these reservoirs is present as natural gas in solution, as thermal energy, and as hydraulic energy. Reservoir depths generally vary from 5000 to 20,000 Ft. with corresponding temperatures from below 200 to above 300 DEG F. For the purposes of this study the resource was divided into three classes depending on depth, with corresponding temperatures, pressures, and gas concentrations. Natural gas is presumed to be present at saturation levels in each class of reservoir. Total-flow, flashed-steam, and binary-cycle thermal energy conversion systems were investigated. The total-flow system was selected for incorporation into a detailed power-plant systems analysis.

Power-plant net power output as a function of wellhead pressure was determined for the two disposal methods (surface and injection) of the wastewater. The peak power output for each class of reservoir and disposal method was selected as the operating points to be used in the economic analysis. The range of output of electricity and gas from 7-IN.-nominal production wells is from 0.36 MW and 6.4 SCF/Sec for the shallow reservoir with fluid disposal by injection to 6.2 MW and 39.9 SCF/Sec for the deepest reservoir with surface disposal. Economic analysis indicates that the relatively shallow reservoirs would not be profitable for combined gas production and electrical power generation, but might be profitable for gas production alone. Deeper reservoirs would be profitable for combined gas production and power generation. The deepest reservoir without gas, would be marginally profitable for electrical generation alone.

763. GGIS-100105/R/ / /M/ / / / /

Title- Potential Power Generation and Gas Production from Gulf Coast Geopressured Reservoirs

Author(s)- / House , P. A. / Johnson , P. M. / Towse , D. F. /

Publication date- May 15 , 1975

Pagination- 28 Pages

Report/patent- UCRL--76416 (Conf--750612-1

Available- NTIS

(Paper copy)

(Microform)

Corporate Author- California Univ.
Lawrence Livermore Laboratories
Livermore , California , USA

Descriptor(s)- / Binary cycles / Economics / Electric power / Flashed steam systems / Geopressured systems / Geothermal energy / Geothermal power plants / Hydraulics / Louisiana / Natural gas / Power generation / Power potential / Production / Texas / Total flow systems / Natural gas production /

Abstract by Energyline

Geopressured aquifers are anomalous in that fluid pressure exists at a value higher than hydrostatic does. The function of a geopressure surface plant would be to recover natural gas as it comes out of solution, and to produce power from hydraulic and thermal energy contained in the water of the geopressured reservoir. The resource geology of such a reservoir is described, and the recoverable energy is estimated. An engineering evaluation of the net power and gas production under various operating conditions is provided.

764. GGIS-100411/0/ / 1/A/ / / / /

Title- Potential Power Generation and Gas Production from Gulf Coast Geopressured Reservoirs

Author(s)- / House , P. A. / Johnson , P. M. / Towse , D. F. /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Geopressured Geothermal Bibliography

Texas

USA

Publication date- Vol. 1, Issue 1, 1975

Pagination- Page 283, 15 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Corporate Author- California University, Livermore

Lawrence Livermore Laboratories

Auxiliary expression(s)-

Illus. / Figure (9) / Graph (6) / Map (2) / Drawing (1) /

Table

Descriptor(s)- / Geothermal energy / Geothermal energy conversion /
Geothermal resources / Gulf of Mexico / Hydraulics / Louisiana /
Natural gas / Power generation / Production / Texas / Total flow
systems / Economic geology / Generation / Power plants /
Possibilities / Economics / Gulf Coast /

Abstract by Author

Extensive on-shore and offshore zones for geopressured water reservoirs are found in the Texas and Louisiana Gulf Coast region. Energy in these reservoirs is present in the form of natural gas in solution, thermal energy, and hydraulic energy. Reservoir depths generally vary from 5000 to 20,000 feet, with corresponding temperatures from below 200 to above 300 DEG F. Natural gas is presumed to exist at saturation levels in the reservoirs. Total-flow, flashed-stream, and binary-cycle thermal energy conversion systems were investigated as a means to utilize the thermal energy. The total-flow system was selected for a detailed power-plant systems analysis. Power-plant net power output was determined for both surface and injection disposal of the waste water. The range of electrical and gas output from 7-inch nominal production wells is from 0.36 megawatts (MW) and 6.4 standard cubic feet per second (SCF/SEC) to 6.2 MW and 39.9 SCF/SEC. The lowest values are for the shallow reservoirs with fluid disposal by injection, and the higher values are for the deepest reservoirs with surface disposal. The shallow reservoirs would not be profitable for combined gas production and electrical-power generation, but might be profitable for gas production alone. Deeper reservoirs would be profitable for combined gas production and power generation. The class of deepest reservoirs, without the presence of gas, would be marginally profitable for electrical generation alone.

765. GGIS-100288/R/ / /M/ / / / /

Title- Potential Producibility and Recovery of Natural Gas from
Geopressured Aquifers of the Cenozoic Sediments of the Gulf
Coast Basin.

Subtitle- Final Report

Author(s)- / Cronquist, C. / Malott, J.P. / Olsen, N.H. / Purser,
P.E. / Zimmerman, F.W. /

Publication date- 1977

Pagination- 39 Pages

Report/patent- FE-2025-3

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U.S. Department of Energy

EX-76-C-01-2025 /

Corporate Author- Gulf Universities Research Consortium

Bellaire , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (5) /

Table

Appendix

Descriptor(s)- / Aquifers / Brines / Economics / Enhanced recovery /

Environmental effects / Gas production / Geopressured reservoirs

/ Gulf Coast / Louisiana / Natural gas / Power generation / Texas

/ Waste disposal / Cost /

Abstract by TIC

The geothermal geopressured gas resource of the Texas-Louisiana Gulf Coast area appears to offer a reasonable chance of developing into an energy resource of considerable magnitude. It has the additional advantage that the gas and electricity can be fed into existing transportation systems at minimal investments, and it would supplement declining production from other sources as it was brought on stream. No fundamental technical problems are foreseen. There appears to be no radically new technology development required. Four critical questions exist--are the individual reservoirs of economic size; are the brines saturated with natural gas; can high well productivity be sustained; and can the brine be disposed of in an economical and environmentally satisfactory manner. These questions can be answered at reasonable cost exposures, and the odds for a successful outcome appear good.

766. GGIS-100077/R/ / /A/ / / / /

Title- Potential Reserves of Natural Gas in the United States Gulf Coast Geopressured Zones

(Chapter 2 of Natural Gas from Unconventional Geologic Sources)

Author(s)- / Dorfman , M. H. /

Publication date- 1976

Pagination- Page 34 , 7 Pages

Report/patent- FE-2271-1

Descriptor(s)- / Gulf of Mexico / Economic geology / Natural gas /

Texas / Louisiana / United States / Gulf Coast / Reserves /

Resources / Possibilities / Geopressured zones / Geopressure /

Economics /

767. GGIS-100167/R/ / /M/ / / / /

Title- Potential Uses for a High-Temperature Borehole Gravimeter

Author(s)- / Hearst , Joseph R. / Kasameyer , Paul W. / Owen , Lawrence B. /

Journal- Houston

Publication date- March 8 , 1978

Geopressured Geothermal Bibliography

Pagination- 11 Pages
Report/patent- UCRL-52421
Available- NTIS
 (Paper copy)
 (Microfiche)
Local Availability- GGIS
Sponsor- / U. S. Department of Energy
 W-7405-ENG-48 /
Corporate Author- California University, Livermore
 Lawrence Livermore Laboratories
 Livermore , California , USA , 94550
Auxiliary expression(s)-
 Illus. / Graph (4) /
 Ref.
 Table
Descriptor(s)- / Aquifers / Compaction / Density / Deposition /
 Elevated temperature / Formation damage / Geologic structures /
 Geothermal wells / Gravimetry / Gravity surveys / Natural gas
 wells / Plugging / Porosity / Stratigraphy /
Abstract by Author
 It is possible to design a canister to cool a borehole
 gravimeter for use in geothermal and high-temperature (up to 350
 DEG C) gas wells. Repeat surveys with such a gravimeter could
 (1) help estimate the extent of reservoir plugging in geothermal
 injection well after one year of operation and (2) detect
 compaction of a geothermal aquifer if the change in thickness of
 the aquifer exceeds 1 M. The instrument could be used together
 with conventional logging tools to evaluate radial dependence
 of density around a well; or to estimate gas-filled porosity
 around wells drilled with mud. A high-temperature borehole
 gravimeter could also be used to evaluate structure and
 stratigraphy around geothermal and high-temperature gas wells.

768. GGIS-100146/B/ / /M/ // //

Title- Power from the Earth
 (Public Policy Bibliographies;3)
 Subtitle- Geothermal Energy
Author(s)- / Tompkins , Dorothy Campbell /
Publication date- September 1972
Pagination- 34 Pages
Available- Institute of Governmental Studies
 University of California
 Berkeley
 California)
Corporate Author- California University, Berkeley
 Institute of Governmental Studies
 Berkeley , California , USA
Descriptor(s)- / Bibliographies / Engineering / Geology / Geothermal
 energy / Government policies / USA / Water resources /
Abstract by NSF/RANN
 This bibliography covers publications since 1965 on
 geothermal energy in the United States and public
 administration, water resources, engineering, and earth
 sciences relating to geothermal energy. Separate sections are
 devoted to geothermal energy in nine states and federal

geothermal programs including the Plowshare Program. The bibliography contains 246 citations and an index. (MPG).

769. GGIS-100163/R/ / /A/ / / / /

Title- Power from Hot Geothermal Brines

Author(s)- / Swearingen , J.S. /

Journal- Chem. Eng. Prog.

Publication date- Vol. 73 , Issue 7 , July 1977

Pagination- Page 83 , 4 Pages

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (2) / Photo (2) /

Table

Descriptor(s)- / Binary fluid systems / Geothermal brines / Heat transfer / Power generation / Scaling / Scaling control /

Abstract by EIC

A method of overcoming scale problems in binary systems, which involve the transfer of heat from a hot well stream into a secondary boiling clean liquid to generate power, is described. The proposal is to transfer the heat from the fluid to the working fluid boiler. Problems with steps in the process and their solutions are explained. The hot brine well system envisioned will produce power, excluding royalty expenses, at around 1.67 cents/kwh.

770. GGIS-100899/O/ / /A/ / / / /

Title- Power Production from High Temperature Geothermal Waters

Author(s)- / Sheinbaum , I. /

Conference- 11 Intersociety Energy Conversion Engineering Conference

Pagination- Page 778 , 8 Pages

Report/patent- SAE--769137

Auxiliary expression(s)-

Illus. / Diagram (3) / Graph (3) /

Table

Ref.

Descriptor(s)- / Binary fluid systems / Cost / Economics / Flashed steam systems / Geothermal brines / High temperature / Performance / Power generation / Thermal efficiency /

Abstract by Author

It appears that the first electrical power production from a liquid-dominated geothermal reservoir to be developed in the United States will be processed from the high salinity, high temperature reservoir. There are currently two recognized state-of-the-art processes and one experimental process for the conversion of high temperature geothermal waters into electric power. The adaptability, the efficiency, and the relative costs of the Direct Contact Binary Cycle for the conversion of high temperature geothermal resources into power, will be explored in this paper and compared with the existing processes. Two types of hot geothermal waters are evaluated: a. high temperature, low salinity, no noncondensables. The Direct Contact Binary Cycle can be characterized as highly efficient, flexible, and very economical when compared to the other power conversion

processes. The process is especially suitable for handling high salinity and precipitating brines.

771. GGIS-100052/J/ / 1504/A/ / / / /

Title- Practical Applications of Optimal Control Theory to History Matching Multiphase Simulator Models

Author(s)- / Wasserman , M. L. / Emanuel , A. S. / Seinfeld , J. H. /

Journal- Soc. Pet. Eng. J.

Publication date- Vol. 15 , Issue 4 , 1975

Pagination- Page 347 , 9 Pages

Descriptor(s)- / Algorithms / Control / Differential equations / Geopressured systems / Lagrange equations / Petroleum deposits / Porosity / Simulation / Storage / Thickness /

Abstract by Author

The pressure history-matching algorithm used is initially based on a discretized single-phase reservoir model. Multiphase effects are approximately treated in the single-phase model by multiplying the transmissibility and storage terms by saturation-dependent terms that are obtained from a multiphase simulator run. Thus, all the history matching is performed by a pseudo single-phase model. The multiplicative factors for transmissibility and storage are updated when necessary. The matching technique can change any model permeability thickness or porosity thickness value. Three field examples are given.

772. GGIS-100528/O/ / /A/ / / / /

Title- Precipitation of CaCO_3 in High Temperature and Pressure Brines in the Presence of Scale Inhibitors Using Novel Saturation Index Calculations

Author(s)- / Oddo , John E. / Sloan , Katherine B. / Tomson , Mason B. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 127 , 6 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRI-5080-321-0317

Sponsor- / National Center for Ground Water Research

EPA CR8069331-01-0 /

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Brines / Calculation methods / Corrosion inhibitors / Equations / High temperature / Mathematical methods / Saturation / Scaling /

Abstract by GGIS

A simplified method of calculating CaCO_3 saturation has been developed. The method of calculation uses only commonly measured field parameters. The calculation saturation index

(SI) and the pH values are accurate at high temperature and high pressure brines. This calculation method is compared to both simpler and more sophisticated calculation methods.

773. GGIS-100528/0/ / /A/ / / / /

Title- Predicting Diagenetic History and Reservoir Quality in the Frio Formation of Brazoria County, Texas and Pleasant Bayou Test Wells

Author(s)- / Kaiser, W.R. / Richman, D.L. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 67, 8 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy

DE-AC08-79ET27111 /

Auxiliary expression(s)-

Illus. / Diagram (7) / Figure (3) / Map (1) /

Table

Ref.

Descriptor(s)- / Brazoria County / Diagenesis / Forecasting / Gulf Coast / Pleasant Bayou No. 1 Well / Pleasant Bayou No. 2 Well / Reservoir properties / Texas /

Abstract by Author

Good quality geothermal reservoirs displaying secondary porosity exist on the upper Texas coast (Brazoria County), site of the Pleasant Bayou No. 1 and No. 2 wells, and are attributed to a moderately stable mineral assemblage, normal geothermal gradients, and low in situ pH. Major authigenic minerals are calcite, quartz, and kaolinite. Detrital feldspar has been extensively albitized at depth. Major diagenetic events overlapped, occurring in the general order--precipitation of calcite, formation of quartz overgrowths, albitization, leaching of calcite to form secondary porosity, and precipitation of kaolinite. Seventeen Brazoria County water analyses including two from the Pleasant Bayou No. 2 well were thermodynamically tested. Predictions based on equilibrium thermodynamics add new insight on mineral stabilities and are consistent with the paragenetic sequence developed from petrographic data. Early precipitation of calcite at shallow depths of burial is predicted. Low temperature and low in situ pH explain the general absence of chlorite. The use of solution-mineral equilibria as a predictor of reservoir quality is inconclusive, but well-defined clustering of waters indicates that identification of regional trends will probably be possible. Shallow waters may be the key to predicting reservoir quality at depth.

774. GGIS-100002/0/ / 3/A/ / / / /

Title- Predicting Gas Reserves in Abnormally Pressured Reservoirs

Geopressured Geothermal Bibliography

Author(s)- / Hammerlindl , D. J. /
Conference- Abnorm. Subsurf. Pressure
Baton Rouge
Louisiana
USA

Publication date- Vol. 3 , 1972

Pagination- Page 7 , 7 Pages

Auxiliary expression(s)-
Illus.

775. GGIS-100054/J/ / 1305/A/ // //

Title- Prediction of Fracture Gradients from Log Derived Elastic Modulus

Author(s)- / MacPherson , L. A. / Berry , L. N. /

Journal- Log Analyst

Publication date- Vol. 13 , Issue 5 , September 31 , 1972

Pagination- Page 12 , 8 Pages

Auxiliary expression(s)-
Ref.

Descriptor(s)- / Well logging / Oil wells / Hydraulic fracturing /
Abstract by NTIS

Sonic and density logs have been obtained where possible from wells in the fields with measured breakdown gradients. Unfortunately, offshore logistics, risks, costs, and particularly hole conditions in highly deviated, geopressure penetrations often preclude obtaining desired porosity logs. However, it is believed the logs and breakdown data available are adequate to investigate the method proposed above. Values for elastic modulus (M) calculated from logs should be related to tensile strength, elasticity and possibly the stress configuration around the well bore. Elastic moduli calculated from logs have been compared with trends of measured fracture gradients in 10 offshore fields and a correlation has been shown to exist. 6 refs.

776. GGIS-100002/O/ / 2/A/ // //

Title- Prediction of Pore Pressure from Penetration Rate (Application in Louisiana)

Author(s)- / Combs , George D. /

Conference- Abnorm. Subsurf. Pressure
Baton Rouge
Louisiana
USA

Publication date- Vol. 2 , 1970

Pagination- Page 35 , 10 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Louisiana / Engineering geology / Sedimentary rocks /
Geopressured reservoirs / Thermodynamic properties /
Geopressure / Gulf Coast / Pore pressure / Relation / Rates /
Penetration / Engineering properties / United States /

777. GGIS-100899/0/ / /A/ / / / /

Title- Preliminary Analysis of Electric Generation Utilizing Geopressured Geothermal Fluids

Author(s)- / Gault , Jack / Hall , James W. / Wilson , John S. / Michael , Herb / Shepherd , Burchard P. / Underhill , Gary / Rios-Castellon , Lorenzo / Rios-Castellon , Lorenzo /

Conference- 11 Intersociety Energy Conversion Engineering Conference

Pagination- Page 790 , 8 Pages

Report/patent- SAE--769128

Auxiliary expression(s)-

Illus / Diagram (4) / Graph (1) /

Table

Ref.

Descriptor(s)- / Binary fluid systems / Economics / Elevated temperature / Environmental effects / Feasibility studies / Flashed steam systems / Geopressure resources / Geothermal fluids / Gulf Coast / Power generation / Power plants / Texas /

Abstract by Author

The geopressured geothermal resources along Texas' Gulf Coast were studied to determine the feasibility of electric power generation. A model resource, developed from regional resource assessment, was characterized for the study: 163 DEG C, 138 bar, 40,000 bbl/day wellhead, 1.13 SCM methane/bbl water. Wells 4300 meter-deep extract the fluids; after utilization, disposal is via 1825 meter-deep reinjection wells. Preliminary conceptual designs for double-flash steam plant and for isobutane secondary working fluid plant are characterized as follows: 8.5 production wells, $0.39 \times 10^{**6}$ SCM methane/day, 25 MW \$738/kW, and 10.2 wells, $0.46 \times 10^{**6}$ SCM methane/day, 25 MW, \$786/kW, respectively. Present worth economic analysis using 1976 prices of \$2.04/ 10^{**6} kJ (methane) and 42 mills/kW-hr busbar (electricity), escalated 2.5% annually, with operation commencing 1980, yields approximately 5% after tax earnings for each plant with a 28¢/ 10^{**6} kJ brine fuel price (relative to 43 DEG C condenser conditions).

778. GGIS-100520/R/ / /M/ / / / /

Title- Preliminary Environmental Assessment of Selected Geopressured-Geothermal Prospect Areas

(Volume I. Comparison of Prospect Areas on the Basis of Potential Environmental Impacts)

Subtitle- Louisiana Gulf Coast Region

Author(s)- / Newchurch , E. J. / Bachman , A. L. / Bryan , C. F. / Harrison , D. P. / Muller , R. A. /

Publication date- October 1978

Pagination- 150 Pages

Report/patent- ORO-5862-7(v.1)

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Department of Energy, Washington, D.C. (USA)

ET-78-S-05-5862 /

Geopressured Geothermal Bibliography

Corporate Author- Louisiana State Univ.

Inst. for Environmental Studies

Baton Rouge , USA

Descriptor(s)- / Air quality / Comparative evaluations / Ecosystems /
Environmental geology / Environmental impact statements /
Geology / Geopressured zones / Gulf Coast / Hydrology / Louisiana
/ Water quality / Well drilling /

Abstract by NTIS

The results of a preliminary environmental assessment of the following geopressured-geothermal prospect areas in the Louisiana Gulf coast region are presented: South Johnson's Bayou, Sweet Lake, Rockefeller Refuge, Southeast Pecan Island, Atchafalaya Bay, and Lafourche Crossing. These prospect areas have been compared to determine their relative environmental acceptability for the test program. Trade-offs among the prospects in terms of potential impacts are highlighted. This assessment was made on the basis of the nature and extent of the proposed testing activities in view of the environmental characteristics of each prospect area: land use, geology and geohydrology, air quality, water resources and quality, ecological systems, and natural hazards. The comparison of prospect areas includes consideration of worst case situations. However, we believe that the test program activities, because they are so small in scale, will not result in major adverse impacts.

779. GGIS-100995/ / / /A/ / / / /

Title- Preliminary Environmental Assessments of Known Geothermal Resource Areas on the United States

Author(s)- / Phelps , Paul L. / Ermak , Don L. / Anspaugh , Lynn R.
/ Jackson , Calvin D. / Miller , Lowell A. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 523 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Energy source development / Environmental effects /
Geothermal resources / Gulf Coast / KGRAs / Louisiana / Texas /
US DOE /

Abstract by Author (rev.)

In order to assure that any development of geothermal resources takes place in an environmentally acceptable fashion, the Office of Assistant Secretary for Environment, DOE, has recently implemented a program that focuses on the early identification of environmental assessment needs. This program is called the Geothermal Overview Project. The basic purpose of the Geothermal Overview Project is to identify, summarize, and assess the environmental issues of the top priority KGRAs from among the approximately 40 KGRAs currently identified by the Division of Geothermal Energy, DOE, as having high possibilities

for commercial development. The Geothermal Overview Project addresses issues pertaining to air quality, ecosystems quality, noise effects, geological effects, water quality, socioeconomic effects and health effects. For each KGRA the following functions are accomplished: (1) identification of key issues, (2) inventory of all available data, (3) analysis and assessment of available data, and (4) identification of what additional information is required for adequate assessments.

780. GGIS-100135/R/ / /M/ / / / /

Title- Preliminary Interpretation of Resistivity and Seismic Refraction Data from the Salton Sea Geothermal Field

Author(s)- / Kasameyer, Paul W. /

Publication date- September 3, 1976

Pagination- 13 Pages

Report/patent- UCRL-52115

Sponsor- / ERDA

W-7405-ENG-48 /

Corporate Author- California University, Livermore

Lawrence Livermore Laboratories

Livermore, California, USA

Descriptor(s)- / Data analysis / Resistivity surveys / Salton Sea Geothermal Field / Seismic refraction surveys /

Abstract by Author/ERA

Seismic refraction and electrical resistivity surveys have been conducted in the Salton Sea Geothermal Field. The resistivity data are used to infer the boundaries of a reservoir of saline fluid. One lateral boundary closely coincides with a fault that was located by seismic refraction.

781. GGIS-100093/I/ / /M/ / / / /

Title- Preliminary Investigation of Geothermal Energy in South Texas

(June 1974-March 1975)

Author(s)- / Dorfman, M. H. / Bebout, D. G. /

Available- University of Texas, Center for Nuclear Studies

University of Texas, Center for Nuclear Studies

200 W. 21ST

Austin, Texas 78712

Sponsor- / Texas Univ. Bureau of Economic Geology

Sponsor- / U.S. Atomic Energy Commission: ERDA /

Corporate Author- Texas Univ.

Center for Energy Studies

Austin, Texas, USA

Descriptor(s)- / Geothermal energy / Geothermal resources / Geological surveys / Salt / Geopressured systems /

Abstract by ERDA/RECON

The objective of this research is to make a preliminary geological evaluation of the geothermal resource in South Texas. The first step in implementing study of the Gulf Coast geothermal resources entails a detailed geological and facies analysis of Frio and trends. In this way the style of deposition of the Frio may be determined as well as the relation

of sedimentation to growth faulting and salt diapirism. Although extensive distribution and occurrence of geopressured zones are inferred, extraction of geothermal fluids will depend upon adequate sand reservoirs being present. This study is for a basic fairway analysis of one discrete interval within the geopressured region. The Frio (Oligocene) appears a likely candidate for detailed investigations. This study will concentrate not only on sand distribution and facies analysis but will correlate and integrate physical parameters from evaluation of an extensive data base of well logs. The physical parameters include porosities, temperatures, temperature gradients, geopressures, top of geopressure horizons, and fluid salinities.

782. GGIS-100407/O/ / /A/ / / / /

Title- Preliminary Map of Temperature Gradients in the Conterminous United States

Author(s)- / Guffanti , Marianne / Nathenson , Manuel /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 53 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project Manager: Vasei W. Roberts

Available- Geothermal Resources Council

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Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Map (2) /

Ref.

Descriptor(s)- / Boreholes / Bottom hole temperature / Comparative evaluations / Contour maps / Geology / Geothermal gradients / Geothermal resources / Heat flow / Maps / North America / Regional analysis / Temperature gradients / Temperature measurement / USA /

Abstract by GGIS

A temperature-gradient map of the conterminous United States has been developed from depth and temperature measurements taken from drill holes of a depth of at least 600m. The map represents regional temperature gradients to a depth of 2km. Contrast between this map and the AAPG-USGS temperature gradient map (in which several central states are shown to be hotter than in this newly developed map) is discussed. The map is also compared with the heat flow map of Sass, et al (1980), and the general relationships between the two are discussed.

783. GGIS-100407/O/ / /A/ / / / /

Title- Preliminary Process and Cost Analysis of a Multipurpose Geothermal Power and Desalination Plant

Author(s)- / Fritzler , Eugene A. / Coury , Glenn E. /
Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
Salt Lake City
Utah
USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 507 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasel W. Roberts

Available- Geothermal Resources Council
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Local Availability- GGIS

Auxiliary expression(s)-
Illus. / Diagram (1) /
Table
Ref.

Descriptor(s)- / Arizona / Capital / Commercialization / Cost /
Desalination / Design / Economic analysis / Electric power /
Feasibility studies / Geologic structures / Geothermal brines /
Geothermal resources / Power generation / Power potential /
Technology assessment /

Abstract by GGIS

Research shows the dual purpose plant which produces both distilled water and electrical power to be the best utilization of a geothermal resource. The technical feasibility and economic analysis for producing both water and power from a specific resource are discussed in this paper. The geothermal resource under consideration is located in east central Arizona near Springerville. Three alternative production ratios of water and power were analyzed. In every case, substantial quantities of both water and power were produced.

784. GGIS-100310/R/ / /M/ / / / /

Title- Preliminary Research on Geothermal Energy Industrial Complexes

Subtitle- Final Report

Author(s)- / Hornburg , C.D. / Lindal , B. /

Publication date- March 1978

Pagination- 227 Pages

Report/patent- IDO/1627-4

Available- NTIS
(Paper Copy)
(Microfiche)

Geopressured Geothermal Bibliography

Local Availability- CES

Sponsor- / U.S. Department of Energy
EG-77-C-07-1627 /

Corporate Author- DSS Engineers, Inc.
Fort Lauderdale , Florida , USA

Auxiliary expression(s)-

Table

Illus. / Figure (67) /

Ref.

Descriptor(s)- / California / Cost / Economics / Flashed steam systems
/ Geopressure resources / Geothermal energy / Idaho / Industrial
plants / Louisiana / Oregon / Process heat / Site selection /
Texas / Uses / Mineral production /

Abstract by Author

The overall purpose of this study was to provide economic, technical and other related information on developing industrial complexes to utilize geothermal energy. An initial screening of products and production processes led to the selection of the following potential Geothermal Energy Industrial Complexes (GEICs): Forest Products; Chlor-Alkali Industries; Alumina-Aluminum; Cellulosic Fibers; Magnesium Compounds and Soda Ash; Petro-Chemicals Complex; Food and Fermentation Products. These were further narrowed down by a market survey, siting analysis and a survey of raw material availability to: Forest Products; Caustic Chlorine; Corn Products and 3 others. Best sites for these are in Oregon, Southern California and Idaho. To supply steam for the process plants in the recommended complexes, a self-beneficiation steam system is developed. Steam can be obtained by flashing low temperature geothermal fluid. The flashed fluid would be passed thru a direct contact boiler to evaporate a secondary fluid. This would drive a turbine and provide shaft power to compress the flashed steam to desired pressures for process use. Steam at pressures up to 135 psia can be produced by this system from geothermal fluid as low as 250 DEG F at lower costs than direct production from fossil fuel. A geothermal system supplying energy to a Forest Products Complex could yield attractive rates of return on investment. A wood chemicals plant that could be built as part of the complex would yield a marginal return on investment. A total of 71 major GEICs can be developed by 2000. These would use 347×10^{12} Btu/yr of geothermal energy. Recommendations include encouraging industrial companies to make specific site studies and pilot testing the steam beneficiation system conceived.

785. GGIS-100533/O/ / /A/ / / / /

Title- Preliminary Test Results of the First Geopressured-Geothermal Design Well, Brazoria County, Texas

Author(s)- / MacDonald , R.C. / Dorfman , M.H. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 105 , 12 Pages

Local Availability- GGIS

Corporate Author- Texas Univ.
Austin , USA

Auxiliary expression(s)-
Illus. / Diagram (1) / Graph (4) /
Ref.

Descriptor(s)- / Analysis / Brazoria County / Drill stem testing /
Growth faults / Gulf Coast / Mathematical methods / Measuring
methods / Numerical analysis / Permeability / Pleasant Bayou No.
2 Well / Production / Reservoir pressure / Reservoir properties /
Test wells / Texas / Well characteristics / Well data / Well
testing /

Abstract by GGIS

The results of short term production tests conducted during
1979 and Fall of 1980 on the Pleasant Bayou No. 2
geopressured-geothermal test well are summarized. The test data
has been analyzed by conventional transient pressure test
analysis methods.

786. GGIS-100899/O/ / /A/ / / / /

**Title- Prerequisites for Military/Civilian Geopressured Geothermal
Resource Development**

Author(s)- / Krause , Fritz R. / Schmidt , Ronald E. / McKown , Gary
L. /

Conference- 11 Intersociety Energy Conversion Engineering Conference
Pagination- Page 860 , 7 Pages

Report/patent- SAE--769148

Corporate Author- National Space Technology Labs
NTSL Station , Mississippi , USA

Auxiliary expression(s)-
Illus. / Map (2) / Graph (2) / Diagram (2) /
Table
Ref.

Descriptor(s)- / Energy source development / Energy demand /
Environmental effects / Federal buildings / Geopressure
resources / Geothermal energy conversion / Gulf Coast /
Hydrocarbons / Military facilities / Recovery processes /
Resource assessment / Uses /

Abstract by Author

The applicability of geopressured geothermal energy resources in
the US Gulf Coast region to demands of federal installations has
been examined. Energy demands for selected NASA and Department
of Defense facilities are determined and compared to potential
supplies from geopressured formations. A system emphasizing
hydrocarbon recovery is proposed, some advantages of offshore
development are discussed, and a case is presented for federal
involvement in resource exploration and utilization technology
during early stages of development.

787. GGIS-100138/R/ / /M/ / / / /

**Title- Present Status of the Polymeric-Materials Screening Program
for the LLL Geothermal Project**

Author(s)- / Lorensen , Lyman E. / Walkup , C. M. / Mones , E. T. /

Geopressured Geothermal Bibliography

Publication date- July 9 , 1975

Pagination- 31 Pages

Report/patent- UCRL-51843

Sponsor- / ERDA

W-7405-ENG-48 /

Corporate Author- California University, Livermore

Lawrence Livermore Laboratories

Livermore , California , USA

Descriptor(s)- / Erosion / Materials testing / Nozzles / Polymers /
Scaling / Total flow systems /

Abstract by Author

Progress is reported on the continuing experimental program aimed at finding high-performance polymeric materials for use in the Lawrence Livermore Laboratory "total flow" process for producing electricity by the use of geothermal brines. Out of a total of 29 polymeric materials which have been screened in a 300 DEG C static brine-test, 7 types of polymers have withstood tests up to 555 hr with less than 10% weight loss. Also, 5 polymeric materials were tested at 250 DEG C for possible service in the less demanding plant components. Polymer structures containing either substantial aromaticity, fluorine, carbonized structure, or aliphatic unsaturation which has been crosslinked, show considerable stability. The presence of water-sensitive groups such as imide, amide, or ester is detrimental even in very thermally stable polymers. Eight nozzles and two wear plates were tested in the field. While plugging of nozzle throats by well debris made interpretation of results difficult, both the nozzles and a wear plate of teflon PFA showed minimal scale deposition and erosion after more than 100 hours of operation. Teflon TFE, and to a much lesser extent teflon PFA, developed surface fibrils while subjected to well flow. Equipment corrosion problems, acquisitions, part fabrication, critical-path planning and future-work plans are discussed.

788. GGIS-100229/J/ / /A/ / / / /

Title- Present Status of Geopressured Geothermal Energy

Author(s)- / Bresee , J. /

Journal- Interstate Oil Compact Comm. Com. Bull.

Publication date- Vol. 19 , Issue 2 , December 1977

Pagination- Page 1 , 5 Pages

Descriptor(s)- / Energy source development / Geopressured zones /
Gulf Coast / Institutional aspects / Louisiana / Natural gas /
Taxes / Texas /

Abstract by TIC

Development of geopressured areas of the Texas and Louisiana coasts is discussed. Separation and use of the natural gas and heat energy are examined. Calculated values for the total recoverable energy in the areas are given. Other discussions are concerned with institutional problems and taxes. (JRD)

789. GGIS-100024/B/ / 11/A/ / / / /

Title- Pressure Depth Relations in Appalachian Region

(Paper 8 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)

Author(s)- / Russell , Williams L. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 11 , 1974

Pagination- Page 122 , 9 Pages

Descriptor(s)- / Appalachians / Petroleum / Economic geology / United States / Gas / Reservoir rocks / Geopressure / Deformation / Basins / Shale / Fluid pressure / Erosion / Sealing / Permeability / Engineering geology / Geopressured reservoirs / Overburden pressure / Oil and gas fields / Pore water / Clay / Diagenesis / Compaction / Loading / Gravity / Tectonics / Gulf Coast / Africa / Nigeria / Asia / Borneo /

Abstract by GGIS

The variety of reservoirs of abnormally low, normal, and abnormally high fluid pressures in the Appalachian region make that region especially suited for research into pressure depth ratios in discontinuous lenticular reservoirs. While each region of the Appalachian reservoirs has a characteristic mean pressure depth ratio extending over a considerable area, the mean values do vary over long distances within the same structural basin. High pressure depth ratios are noted in deformed regions, while no correlation is seen between pressure depth ratios and depth. Field evidence suggests that abnormally low fluid pressures occur in regions undergoing erosion or which have undergone erosion in recent geologic time. Available data show lower pressure depth ratios in reservoirs associated with shales. The cause of these abnormally low fluid pressures cannot presently be determined conclusively. The best explanation seems to be that fluid pressures in shales are decreased as a result of erosion, and that rocks of very low permeability between the shales and the reservoirs permit just enough fluids to migrate from the reservoirs to the shales, but not enough to equalize the pressure depth ratios between reservoirs.

790. GGIS-100407/O/ / /A/ / / / /

Title- Pressure Instrumentation for Geothermal Borehole Logging

Author(s)- / McConnell , Thomas D. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 365 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasei W. Roberts

Available- Geothermal Resources Council

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Geopressured Geothermal Bibliography

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Graph (2) /

Table

Ref.

Descriptor(s)- / Boreholes / Comparative evaluations / Geothermal reservoirs / Measuring instruments / Performance / Pressure measurement / Specifications / Temperature monitoring / Thermodynamic properties / Well logging /

Abstract by GGIS

Accurate measurements of pressure change used to determine reservoir capacity often require measurement of the pressure response with a resolution of .01 psi, frequently in environments of 15,000 psi and 275 deg C. The purpose of this report is to evaluate the basic types of pressure transducers in use and with respect to these requirements. The deficiencies, limitations and research and development activities of each type of transducer are discussed.

791. GGIS-100041/J/ / 1101/A/ / / / /

Title- Pressure Measuring at the Depth Used in Geological Prospecting

Subtitle- Criteria and Techniques

Original Title- Hlubinna Mereni Tlaku V Geologickm Przkumu

Author(s)- / Krajca , J. /

Journal- Geol. Prukum.

Publication date- Vol. 11 , Issue 1 , 1969

Pagination- Page 8 , 4 Pages

Language- Czech

Auxiliary expression(s)-

Sum.

Descriptor(s)- / Well logging / Measuring methods / Measurement / Geopressure / Boreholes /

792. GGIS-100002/O/ / 3/A/ / / / /

Title- Pressure Prediction with Flowline Temperature Gradients

Author(s)- / Wilson , G. J. / Bush , R. E. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 3 , 1972

Pagination- Page 75 , 5 Pages

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Engineering geology / Geopressured reservoirs / Overburden pressure / Pressure buildup / Geopressure / Measurement / Measuring methods / Temperature / Gradient / Shale / Sandstone /

793. GGIS-100023/J/ / 5704/A/ / / / /

Title- Pressured Shale and Related Sediment Deformation

(on Seaward Flanks of Deeply Buried Linear Shale Masses, on Seismic Data, Texas)

Subtitle- Mechanism for Development of Regional Contemporaneous Faults

Author(s)- / Bruce , Clement H. /

Publisher- American Association of Petroleum Geologists

Journal- American Association of Petroleum Geologist Bulletin

Publication date- Vol. 57 , Issue 4 , 1973

Pagination- Page 878 , 9 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Texas / Faults / Sedimentary rocks / Tertiary / Structural geology / Distribution / Clastic rocks / Terrigenous / United States / Gulf Coast / Regional / Contemporaneous / Origin / Geopressure / Shale / Deformation /

794. GGIS-100024/B/ / 11/A/ / / / /

Title- Pressured Shale and Related Sediment Deformation

(Paper 13 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)

Subtitle- Mechanism for Development of Regional Contemporaneous Faults

Author(s)- / Bruce , Clement H. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 11 , 1974

Pagination- Page 166 , 9 Pages

Descriptor(s)- / Gulf Coast / Faults / Structural geology / Mechanics / Texas / Deformation / Geopressure / Shale / Pore water / Contemporaneous faults / Oil and gas fields / Tertiary / United States /

Abstract by GGIS

Low-density (high-pressure) shale is a major factor in the formation of contemporaneous faults along the Texas Gulf Coast. Residual masses of undercompacted shale are formed between sandstone-shale depoxes where greater compaction has occurred. The primary process causing the development of these residual shale masses is differential compaction resulting from differential loading and shale diagenesis. Regional contemporaneous faults are caused by differential compaction and gravity slide. It is hypothesized that high fluid pressure in the shale masses greatly reduces internal friction, promoting the formation of low-angle gravitational faults. This process produces very complex fault systems. Three types of regional contemporaneous faults are defined, according to whether, during their development, the rate of deposition of sediments exceeds, is equal to, or is exceeded by the rate of subsidence of underlying clays. Bedding plane faults occur where the dip of the fault plane becomes the same as the dip of the basinward tilted beds, so that all major displacement thereafter is parallel to the bedding. A hypothetical gap occurs in the upper,

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normal part of the fault zone, but it does not occur in nature, being filled by collapsed material from either side of the fault. Faults found on the landward side of shale masses are generally postdepositional, with relatively small amounts of displacement. Fault flattening is common for contemporaneous faults, and is associated with fluid pressure increases at depth.

795. GGIS-100407/O/ / /A/ / / / /

Title- Price and Cost Estimates for Hot Water Geothermal Energy
Author(s)- / Howard , J.H. /
Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
Salt Lake City
Utah
USA (September 9 , 1980)
Publisher- Geothermal Resources Council
Davis, CA
Publication date- Vol. 4 , 1980
Pagination- Page 723 , 4 Pages
Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasel W. Roberts
Available- Geothermal Resources Council
P.O. Box 98
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Local Availability- GGIS
Auxiliary expression(s)-
Illus. / Graph (4) /
Ref.
Descriptor(s)- / Charges / Cost / Cost benefit analysis / Data /
Equations / Forecasting / Geothermal fluids / Graphs / Income /
Market / Production /
Abstract by GGIS

Estimates of the costs associated with production and sale of hot water geothermal energy are presented in this paper. Equations are presented that would allow the producer-seller to determine the costs of producing quantities of fluid containing geothermal energy and also estimate the price that could be obtained from selling the energy contained in the geothermal fluid. Recent trends suggest that the industry will see a production cost increase of about 10-15% per year, and the price of geothermal hot water will increase by about 20-25% per year.

796. GGIS-100407/O/ / /A/ / / / /

Title- Pricing Direct Use Geothermal Energy
Author(s)- / Higbee , Charles V. /
Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
Salt Lake City
Utah
USA (September 9 , 1980)

Publisher- Geothermal Resources Council
 Davis, CA
 Publication date- Vol. 4, 1980
 Pagination- Page 719, 4 Pages
 Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasei W. Roberts
 Available- Geothermal Resources Council
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 Local Availability- GGIS
 Auxiliary expression(s)-
 Illus. / Graph (2) /
 Table
 Descriptor(s)- / Charges / Comparative evaluations / Cost / Direct
 energy utilization / Electric power / Exploitation / Geothermal
 energy / Geysers Geothermal Field / Laws / Leasing / Legal
 aspects / Legislation / Mathematical models / Power generation /
 Public lands / Resource depletion / Resource development /
 Royalties / Vapor dominated systems /
 Abstract by GGIS

The Geothermal Steam Act of 1970 was written during development of the Geysers geothermal field in California. Because of this temporal relationship parts of the act were directed specifically for use with the Geysers project. Provisions for royalties, drilling deductions and percentage depletion allowances, while appropriate for the Geysers project, have not proven to be appropriate for other projects. The major problem with the act is its assumption that all geothermal resources are depletable, and further legislation has supported this assumption. In fact, direct use geothermal energy may be considered a renewable energy resource. In failing to consider this possibility, the act has discouraged development of direct use geothermal projects.

 797. GGIS-100024/B/ / 11/A/ / / / /

Title- Primary Migration of Petroleum from Clay Source Rocks
 (Paper 11 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)
 Author(s)- / Chapman, Richard E. /
 Publisher- American Association of Petroleum Geologists
 Publication date- Vol. 11, 1974
 Pagination- Page 141, 7 Pages
 Descriptor(s)- / Petroleum / Origin / Migration / Primary / Shale /
 Clay / Sources / Mechanism / Diagenesis / Compaction / Fluid
 release / P-T conditions / Geopressure /
 Abstract by GGIS

The primary migration of petroleum from compacting clay rocks in a dominantly regressive sequence is considered. It has been held that petroleum generation and primary migration begin early, and that petroleum is lost unless a trap exists at this early stage. However, a thick clay will compact more slowly than a thin clay, other factors being equal, and the rate of fluid expulsion is also correspondingly less. The ratio of liquid

expelled to initial interstitial liquid is defined. The ratio shows that at any given depth, the higher the interstitial liquid pressure, the higher the proportion of original liquid retained in the clay. The slowed compaction of thick clays exposes more pore liquids to higher temperatures and pressures over a longer period of time. Higher temperatures, higher pressures, and delayed expulsion cause a larger proportion of the protopetroleum to be dissolved in the interstitial water. If saturation is reached, petroleum will be released from solution before expulsion from the clay. Thus a slug may accumulate in the outer layer of the clay large enough to be expelled by capillary force and the fluid potential gradients.

798. GGIS-100023/J/ / /A/ // //

Title- Primary Migration of Petroleum from Clay Source Rocks

Author(s)- / Chapman, R.E. /

Publisher- American Association of Petroleum Geologists

Publication date- Vol. 56, Issue 11, November 1972

Pagination- Page 2185, 7 Pages

Descriptor(s)- / Clay / Compaction / Diagenesis / Diffusion /
Geopressured systems / Migration / Petroleum / Petroleum
migration /

Abstract by DOE/Recon

An important difficulty in explaining primary migration from compacting source rocks concerns timing. The commonly accepted compaction curves for clay rocks imply maximum fluid expulsion early in a clay's compaction history, whereas most accumulations clearly have been formed later, after burial to depths of several thousands of feet. It was shown recently that abnormally pressured clays have been abnormally pressured since burial to a shallow depth. It was concluded that the thicker clays in most sedimentary basins have been abnormally pressured to some extent. If this conclusion is correct, the expulsion of petroleum becomes reconcilable with the time of entrapment because (a) thicker source clays, e.g., more than 200 feet, or 60 m, initial thickness, are probably more important than thinner source clays, and (b) mean fluid expulsion from the thicker clays is retarded. In addition, most of the fluid in a thin clay is expelled under geothermal temperatures and essentially hydrostatic pressures (implied in early migration) over a small depth range, whereas fluid in a thick clay is exposed to geothermal temperatures and near-geostatic pressures over a much greater depth range. The protopetroleum thus may be subjected to higher temperatures and much higher pressures for a longer time, thereby facilitating its solution in the pore water. The pressure decrease that necessarily accompanies expulsion may lead to the release of petroleum from solution in the outer, compacting layer of clay, and the accumulation of a slug that could be expelled by capillary force aided by the fluid potential gradient.

799. GGIS-100565/R/ / /M/ // //

**Title- Problem Definition Study of Subsidence Caused By
Geopressured Geothermal Resource Development**

Publication date- December 1980

Pagination- 196 Pages

Report/patent- GSRMP-10

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-48 /

Corporate Author- EDAW, Inc.

Palo Alto , CA , USA

Corporate Author- Earth Science Associates

Palo Alto , CA , USA

Descriptor(s)- / Energy source development / Forecasting /
Geopressure resources / Ground subsidence / Gulf Coast /
Resource development / Socio-economic factors /

Abstract by NTIS

The environmental and socio-economic settings of four environmentally representative Gulf Coast geopressured geothermal fairways were inventoried. Subsidence predictions were prepared using feasible development scenarios for the four representative subsidence sites. Based on the results of the subsidence estimates, an assessment of the associated potential environmental and socioeconomic impacts was prepared. An inventory of mitigation measures was also compiled. Results of the subsidence estimates and impact assessments are presented, as well as conclusions as to what are the major uncertainties, problems, and issues concerning the future study of geopressured geothermal subsidence.

800. GGIS-100528/0/ / /A/ / / / /

**Title- Problems and Partial Solutions in Using the S.P. Log to Predict
Water Salinity in Deep Hot Wells**

Author(s)- / Dunlap , H.F. / Dorfman , M.H. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 189 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
Geothermal Energy

DE-AC08-79ET27112 /

Auxiliary expression(s)-

Illus. / Graph (6) / Map (1) /

Table

Ref.

Descriptor(s)- / Gulf Coast / Interstitial water / Louisiana /
Salinity / Sp logging / Texas / Wells /

Abstract by Author

Predictions of formation water salinity from SP logs using conventional methods are usually too low in deep, hot wells of the Texas-Louisiana Gulf Coast. We found a standard deviation of 69,000 ppm when comparing predicted salinities with good measured values. The underestimation of salinity leads to an overestimation of the amount of methane which can be dissolved in

Geopressured Geothermal Bibliography

these waters, an important parameter in assessing the economic feasibility of geothermal-geopressured projects. We have developed an improved technique using an inferred R subscript MF value, and a geologic age correction. This reduces the standard deviation to 21,000 ppm.

801. GGIS-100308/O/ / /A/ / / / /

Title- Problems in Estimation of Salinity Profile in Liquid Dominated Geothermal Systems

Author(s)- / Ershaghi , I. / Dougherty , E.L. / Ucock , H. / Ghassemi , F. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 181 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

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Local Availability- CES

Corporate Author- University of Southern California

Petroleum Engineering Dept.

Los Angeles , California , USA

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Geothermal wells / Resistivity logging / Salinity / Well logging /

Abstract by Author

Estimation of salinity profile in producing geothermal wells is of great importance in subsurface mapping and in designing the well completion. Well logs have traditionally been used to estimate R (sub w) and, hence salinity, in sedimentary type oil field reservoirs. Geothermal reservoirs introduce complexities which can lead to errors in interpretation of well log data using existing oil field correlations. This paper presents a review of certain aspects of the problem with examples from the Cerro Prieto field in Mexico.

802. GGIS-100071/R/ / /M/ / / / /

Title- Problems in Identifying, Developing, and Using Geothermal Resources

Publisher- Government Accounting Office

Publication date- March 3 , 1975

Pagination- 76 Pages

Report/patent- RED--75--330

Auxiliary expression(s)-

Illus. / Photo (1) /
 Descriptor(s)- / Geothermal energy / Financing / Onshore fuel leasing
 / Drinking water / Geysers / Desalination / California / Public
 lands / Laws / U.S. Energy Research and Development
 Administration / U.S. Bureau of Reclamation / Power plants /
 Offshore fuel leasing /

Abstract by NTIS

Geothermal resources, including dry steam, hot mineralized water, hot dry rock, and geopressured zones, can be used to produce energy, fresh water, and minerals. The federal budget for FY 1975 requested \$49 million for geothermal exploration and R&D. Development of electrical power from geothermal resources, the geothermal leasing program and production of potable water from geothermal brines are assessed. Recommendations are provided. (1 photo)

 803. GGIS-100540/J/ / /A/ / / / /

Title- Problems Arise for Geopressure Natural Gas

Author(s)- / Waldrop , Mitch /

Publication date- Vol. 57 , Issue 5 , January 29 , 1979

Pagination- 2 Pages

Local Availability- GGIS

Descriptor(s)- / Artificial recharge / Brazoria County / Geopressured
 zones / Louisiana / Methane / Natural gas / Pleasant Bayou No. 1
 Well / Reserves / Salinity / Texas / Well drilling /

Abstract by GGIS

Problems stemming from the high salinity of geopressured water make recovery of natural gases from these waters more difficult than once thought. Uncertainties about methane content, waste water disposal, and geopressured zone performance will be better understood as DOE drilling projects advance.

 804. GGIS-100297/J/ / /A/ / / / /

Title- Problems Arise for Geopressure Natural Gas

Author(s)- / Waldrop , Mitch /

Journal- Chem. Eng. News (Wash., D.C.)

Publication date- Vol. 57 , Issue 5 , January 29 , 1979

Pagination- Page 31 , 2 Pages

Descriptor(s)- / Geopressured reservoirs / Methane / Salinity /
 Solubility / Toxicity / Waste disposal / Waste injection / Waste
 water /

Abstract by PROMPT

DOE will spend \$27 million to study the problems of geopressure natural gas such as disposal of the water produced, about 8,000 m³/well/day. Salinities are very high, ranging 15,000-275,000 mg/l of dissolved solids, mostly sodium, calcium and chloride ions. The presence of toxic components such as boron, ammonia, and other trace metals make it unsuitable for drinking, irrigation or straightforward disposal into the ocean. Researchers have corrected the dilution factor by using chemical geothermometers, which help them measure the dilution factor and calculate the original water's true salinity underground. In

order to reinject the water into shallower strata, the water in the disposal site will have to be matched with the geopressure waters, or the carbonate and sulfate precipitates of calcium, strontium and barium will block the porosity in the rocks around the injection point. Also, the solubility of methane decreases substantially as salinities increase, so it is unknown whether the water is saturated with methane.

805. GGIS-100475/O/ / /M/ / / / /

Title- Proceedings

Conference- Invitational Well-Testing Symposium

Berkeley

CA

USA (October 21 , 1977)

Publication date- October 19 , 1977

Pagination- 195 Pages

Report/patent- LBL-7027

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy /

Corporate Author- California Univ.

Lawrence Berkeley Lab.

Berkeley , USA

Auxiliary expression(s)-

Illus. / Diagram (35) / Figure (19) / Graph (102) /

Table

Ref.

Descriptor(s)- / Drilling / Geopressured wells / Hydrogeology / Mathematical models / Measuring instruments / Meetings / Petroleum exploration / Proceedings / Recommendations / Well testing /

Abstract by Author (revised)

During the last ten years, the techniques and equipment of well testing have undergone a phenomenal development. The symposium was held to evaluate the state of the art in general, and its application to geothermal systems in particular. The symposium provided the 150 participants a forum in which to exchange ideas and present new information on instrumentation, technique development, and well test analysis. The emphasis was on reviewing existing capabilities, identifying current limitations, and generating new ideas for extending well-test capabilities. The participants were well-testing experts from the oil and gas industries, and from the fields of geothermal energy and ground water hydrology. In addition to identifying areas which need additional research and development, the symposium sought to unify, where possible, the ideas and methods of these three disciplines.

Water rights /

Abstract by TFC

806. GGIS-100008/O/ / / 1/M/ / / / /

Title- Proceedings

Conference- Geothermal Power Development

Publication date- June 18 , 1974

Report/patent- LBL--3099

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Abstract by GGIS

As part of the Federal government's energy program, research and development has been launched in the area of geothermal energy, with the objective of stimulating and facilitating commercial utilization of geothermal energy for power production. The Geothermal Power Development Conference was convened as an information exchange to allow the Atomic Energy Commission and other laboratories from around the country to describe their geothermal programs. A separate abstract was prepared for the presentation of the Lawrence Livermore Laboratory's work in the recovery of geopressure resources.

807. GGIS-100004/0/ / /M/ / / / /

Title- Proceedings

Conference- Development and Utilization of Geothermal Resources

Publication date- Vol. 1 , May 29 , 1975

Available- Superintendent of Documents

U.S. Government Printing Office

Washington, D.C.

20402

USA

Local Availability- CES

808. GGIS-100212/0/ / / / / / /

Title- Proceedings of the First Workshop on Sampling Geothermal Effluents

Conference- 1. Workshop on Sampling Geothermal Effluents

Las Vegas

Nevada

USA (October 20 , 1975)

Publication date- May 1976

Pagination- 234 Pages

Report/patent- EPA-600/9-76-011

809. GGIS-100999/0/ / /M/ / / / /

Title- Proceedings of the 13th Intersociety Energy Conversion Engineering Conference

Subtitle- Volume 2

Conference- 13th Intersociety Energy Conversion Engineering Conference

San Diego

Geopressured Geothermal Bibliography

California
USA (August 20 , 1978)
Publication date- Vol. 2 , August 20 , 1978
Pagination- 819 Pages
Available- Society of Automotive Engineers, Inc.
400 Commonwealth Drive
Warrendale
Pennsylvania
15096
Local Availability- Eng.
Corporate Author- Society of Automotive Engineers, Inc.
Warrendale , Pennsylvania , USA

810. GGIS-100304/0/ / /M/ / / / /

Title- Proceedings of the 8th Intersociety Energy Conversion Engineering Conference
Conference- 8th Intersociety Energy Conversion Engineering Conference
Philadelphia
Pennsylvania
USA (August 13 , 1973)
Publisher- University of Pennsylvania
Philadelphia, Pennsylvania
Journal- Intersociety Energy Conversion Engineering Conference
Publication date- 1973

811. GGIS-100214/0/ / /M/ / / / /

Title- Proceedings of Conference on Geothermal Energy and the Law
Author(s)- / Stone , C. D. /
Conference- Conference on Geothermal Energy and the Law
Santa Barbara
California
USA (February 3 , 1975)
Publication date- 1975
Pagination- 77 Pages
Report/patent- NSF-RA-S--75-003
Available- University of Southern California
Santa Barbara
California
USA
Local Availability- CES
Sponsor- / NSF/RANN
Aer 7509194 /
Corporate Author- University of Southern California
Los Angeles , California , USA
Descriptor(s)- / Geothermal resources / Institutional aspects /
Investment / Jurisdiction / Land leasing / Laws / Leasing / Legal
aspects / Licensing / Ownership / Public utilities / Taxes / Uses
/ Water rights /
Abstract by TIC
Work group reports are presented for the following problem
areas: legal and other institutional barriers complicating
efforts at the earliest stages of geothermal development; the

perspective of potential investors and the connection with specific uncertainties in the legal environment; preserving the interests of the government, the public generally, and the private geothermal lessors; the various water law conflicts, including potential conflicts between users of water in geothermal production and users of water for other purposes; jurisdictional conflict and overlapping administration; and problems of utilities and dependent users. (MHR)

812. GGIS-100528/0/ / /A/ / / / /

Title- Process Technology

Subtitle- Introduction

Author(s)- / Goldsberry, Fred L. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 117, 1 Pages

Local Availability- GGIS

Local Availability- CES

Descriptor(s)- / Economics / Energy conversion / Institutional aspects / Technology assessment /

Abstract by GGIS

Introductory remarks to the presentation of papers concerning process technology are presented.

813. GGIS-100995/ / / /A/ / / / /

Title- Processing of Geothermal Brine Effluents for Reinjection

Author(s)- / Quong, R. / Schoepflin, F. / Stout, N.D. / Tardiff, G.E. / McLain, F.R. /

Publication date- Vol. 2, Issue 2, 1978

Pagination- Page 551, 551 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- California Univ., Livermore

Lawrence Livermore Lab.

Livermore, California, USA

Auxiliary expression(s)-

Table

Illus. / Graph (1) / Diagram (1) /

Ref.

Descriptor(s)- / Chemical composition / Cost / Geothermal brines / Mineral wastes / PH value / Silica minerals / Solids / Waste injection /

Abstract by Author

The handling of brine effluents for injection is a critical part of any geothermal conversion process. Brine effluents from the San Diego Gas & Electric/Department of Energy - Geothermal Loop Experimental Facility were characterized for particulate

Geopressured Geothermal Bibliography

concentration and chemical composition. Bench scale tests were conducted with inorganic and organic coagulants as a means of enhancing the sedimentation process for separation and removal of suspended solids, principally amorphous silica. The effects of temperature, retention time, and pH on the precipitation of supersaturated silica, subsequent floc settling properties, and supernatant clarity were determined. A pilot sized clarifier with mixed media sand or precoat pressure filtration have been successfully tested as a means of producing injectable brine effluents. Preliminary cost estimates range in the vicinity of 20¢/1000 gallons.

814. GGIS-100407/O/ / /A/ / / / /

Title- Production of "Food Grade" (Culinary) Steam with Geothermal (Geo-heat) for Industrial Use

Author(s)- / Wehlage, Edward F. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 657 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (4) / Graph (1) / Photo (1) /

Ref.

Descriptor(s)- / Boilers / Chemical composition / Chemical effluents / Contamination / Cost / Economics / Food processing / Industry / Natural steam / Process heat / Production / Steam / Steam generators / Water quality / Water treatment /

Abstract by GGIS

In the case where geothermal steam might be used for introduction into food, beverages and pharmaceuticals as "food grade", or culinary steam, the economics of using the geothermal resource would have to compare favorably with those of a conventional energy source. The need to purify geothermal steam (although sterile, it contains impurities and contaminants), and the associated cost, is a significant factor in evaluating the overall costs of geothermal food grade steam. Currently, the best way to obtain culinary steam is by using a water-to-steam unfired boiler which is adaptable for geothermal service.

815. GGIS-100349/J/ / /A/ / / / /

Title- Production of Medium Pressure Process Steam from Low Temperature Geothermal Fluid

Author(s)- / Hornburg , C.D. /

Journal- Energy

Publication date- Vol. 3 , Issue 3 , 1978

Pagination- Page 29 , 2 Pages

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (2) / Photo (2) /

Ref.

Descriptor(s)- / Capital / Cost / Economics / Geothermal energy /
Geothermal energy conversion / Heat exchanger / Heat transfer /
Separation processes / Steam turbine power generation /

Abstract by GGIS

It is possible to extract energy directly from geothermal fluid by means of direct heat exchange to the process fluid; steam production for generating shaft power; or secondary vapor production for generative electricity, shaft power or process heat. The economic and technical aspects of using geothermal energy directly in these ways are discussed.

816. GGIS-100374/O/ / /A/ / / / /

Title- Production Behavior and Economic Assessment of Geopressured Reservoirs in the Texas and Louisiana Gulf Coast
(2. Session: EPRI Project Reports)

Author(s)- / Swanson , R. K. / Osoba , J. S. /

Conference- 3rd Annual Geothermal Conference and Workshop Proceedings
Monterrey
California

USA (June 26 , 1979)

Publisher- Electric Power Research Institute
Palo Alto, California

Publication date- October 1979

Pagination- Page 1 , 8 Pages

Report/patent- EPRI-WS-79-166

Local Availability- CES

Auxiliary expression(s)-

Illus. / Map (1) / Graph (10) /

Table

Ref.

Descriptor(s)- / Economics / Flow rate / Gas production / Geopressured
reservoirs / Gulf coast / Louisiana / Methane / Power potential /
Resource assessment / Texas / Water production /

Abstract by Author

Gulf Coast geopressured zones show promise of yielding moderately large quantities of hot water and methane. Based on the sand volume contained within the twenty prospective geopressured areas so-far defined, the total energy recoverable by primary pressure depletion is in the range of 7 trillion cu. ft. of methane and 13 Quads of thermal energy, assuming all these areas prove productive. Wells drilled to exploit these

reservoirs will probably be capable of flowing at rates from 10,000 to 40,000 bbl/day for periods of from ten to twenty years. Reservoir modelling and economic analysis of the Brazoria, TX prospect, site of a currently drilling DOE test well, indicates a well will produce a total of 71 million barrels of 300 DEG F water in twenty years, based on optimistic reservoir parameters. On this basis, the well will show a small net return on investment if the gas can be sold for 7.50/mcf, if the water can be sold for 5¢/bbl, and if the spent fluid can be disposed of for 5¢/bbl.

817. GGIS-100533/O/ / /A/ / / / /

Title- Production Decline Analysis Using Influence Functions

Author(s)- / Zais, Elliot J. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16, 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- 5 Pages

Local Availability- GGIS

Corporate Author- Elliot Zais & Assoc., Inc.
Corvallis, OR, USA

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (4) /

Ref.

Descriptor(s)- / Analysis / Calculation methods / Decline curve analysis / Equations / Geothermal reservoirs / Mathematical methods / Mathematics / Numerical analysis / Production / Production decline curve /

Abstract by GGIS

Progress made in using influence functions to analyze reservoir production decline is reviewed.

818. GGIS-100076/R/ / /M/ / / / /

Title- Program Definition for the Development of Geothermal Energy (2. Vol.)

Subtitle- Program Definition Development Rationale and Subprogram Descriptions

Publisher- Jet Propulsion Lab.
Pasadena, California

Publication date- Vol. 3, August 29, 1975

Pagination- 195 Pages

Report/patent- JPL--5040-6 (Vol. 2)

Descriptor(s)- / Energy source development / Geothermal exploration / Geothermal resources / Government policy / Research programs / Socio-economic factors / Uses /

Abstract by EPA

The purpose of this study is to give a comprehensive program definition of an integrated effort and commitment for effectively developing geothermal energy resources. A problem analysis discussion is given along with program development

suggestions. Subprograms such as resource exploration, utilization, research and development, community planning, and policy analysis are described in detail. (MOW)

819. GGIS-100076/R/ / /M/ / / / /

Title- Program Definition for the Development of Geothermal Energy
(1. Vol.)

Subtitle- Background and Program Definition Summary
Publisher- Jet Propulsion Lab.
Pasadena, California

Publication date- Vol. 3 , August 29 , 1975

Pagination- 57 Pages

Report/patent- JPL--5040-6 (Vol. 2)

Descriptor(s)- / Commercialization / Geothermal resources /
Institutional aspects / Research programs /

Abstract by EPA

The research program defined, with its supporting rationale, includes proposed federal government actions to facilitate a significant acceleration in the commercial utilization of the nation's valuable geothermal energy.

820. GGIS-100076/R/ / /M/ / / / /

Title- Program Definition for the Development of Geothermal Energy
(3 Volumes)

Publisher- Jet Propulsion Lab.
Pasadena, California

Publication date- Vol. 3 , August 29 , 1975

Report/patent- JPL--5040-6 (Vol. 2)

Corporate Author- Jet Propulsion Lab
Pasadena , California , USA

821. GGIS-100076/R/ / /M/ / / / /

Title- Program Definition for the Development of Geothermal Energy
(3. Vol.)

Subtitle- Appendices
Publisher- Jet Propulsion Lab.
Pasadena, California

Publication date- Vol. 3 , August 29 , 1975

Pagination- 389 Pages

Report/patent- JPL--5040-6 (Vol. 2)

Abstract by EPA

The following appendixes are given: (1) implication of the 1985 goal and updated sensitivity analysis, (2) geothermal development timelines, (3) leasing and exploration, (4) research and development, (5) electric utilities, (6) nonelectric geothermal market, (7) geopressurized resource R and D, (8) community planning, (9) summary of ERDA patent policy relevant to geothermal energy (10) factors affecting the development of known geothermal prospects, (11) environmental

Geopressured Geothermal Bibliography

laws and regulations, (12) elementary treatment of economics of geothermal power production, (13) conversion cycle analysis, (14) Geothermal Energy, Research, Development, and Demonstration Act of 1974. Separate abstracts were prepared for each appendix. (MOW)

822. GGIS-100045/J/ / 8305/A/ / / / /

Title- Programmed Modelling of Deep Thermodynamic Conditions in Experimental Studies of Elastic Properties of Mineral Matter

Author(s)- / Lebedev , T. S. / Shapoval , V. I. / Korchnoi , V. A. /
Journal- Gerlands Beitr. Geophys.

Publication date- Vol. 83 , Issue 5 , 1974

Pagination- Page 340 , 7 Pages

Auxiliary expression(s)-

Sum.

Illus.

Descriptor(s)- / Geophysics / Automatic data processing / Crust /
Theoretical studies / USSR / Rocks / Pressure buildup /
Temperature / Effects / Physical properties / Elasticity /
Models / Mathematical methods / Thermodynamics / Experimental
studies / Geothermal gradient / Ukraine / P-T conditions /

823. GGIS-100407/O/ / /A/ / / / /

Title- Progress in Direct Heat Applications Projects

Author(s)- / Childs , F.W. / Jones , K.W. / Nelson , L.B. / Strawn ,
J.A. / Tucker , M.K. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal
Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 549 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Table

Ref

Descriptor(s)- / Comparative evaluations / Construction / Cost /
Demonstration programs / Design / Direct energy utilization /
Economics / Environmental impacts / Feasibility studies /
Hydrothermal systems / Information / Institutional aspects /
Pilot plants / Public relations / Resource assessment /

Technology assessment / Technology utilization / Testing / Well drilling /
 Abstract by GGIS

Twelve demonstration projects which illustrate the technical and economic feasibility of direct geothermal heat use are discussed in this report. Although these demonstration projects are still in the early phase of development, they are already providing useful technical, economic, operational and environmental information. The report summarizes the economic and engineering data obtained thus far, discusses environmental and institutional concerns and compliance and offers methods of solutions for those problems. Another benefit of the demonstration projects is pointed out: that of the public's increased awareness of the potential of geothermal energy.

824. GGIS-100393/O/ / /A/ / / / /

Title- Progress Report on Evaluation of Entrained Methane in Deep Reservoirs, Texas Gulf Coast

Author(s)- / Gregory , A. Ray / Dodge , Marianne M. / Posey , Jan S. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 1, June 1980

Pagination- Page 414, 60 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

78712

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

DE-AC08-78ET-11397 /

Corporate Author- Texas Univ., Austin

Bureau of Economic Geology

Austin, TX, USA

Auxiliary expression(s)-

Illus. / Diagram (7) / Graph (15) / Map (14) / Figure (1) /

Table

Ref.

Descriptor(s)- / Areal geology / Bulk density / Evaluation / Fluid pressure / Geopressured reservoirs / Maps / Methane / Reservoir / Resource assessment / Salinity / Texas / Electrical logging / Formation thickness / Frio Formation / Porosity / Vicksburg Formation / Wilcox Formation /

Abstract by Author

The major objective of this study is to appraise the total volume of in-place and recoverable methane dissolved in formation waters of sandstone reservoirs along the onshore Texas Gulf Coast from 8,000 FT (approximate base of oil production) to the base of the Wilcox Group (deepest significant sandstone occurrence). Volume and distribution of potential reservoirs were determined by utilizing electric logs which form a grid of structural dip and strike cross sections that extend from near

the Wilcox outcrop to the coastline. Total thickness and net-sandstone distribution maps were constructed for each formation. Significant amounts of sandstone are found in the Wilcox Group, Upper Claiborne (Yegua), Vicksburg, and Frio Formations. Only the Yegua Formation is not geopressured. The Texas Gulf Coast was divided into 24 subdivisions for purposes of detailed mapping and calculation of methane resource. Boundaries of these subdivisions were determined by structural provinces, the San Marcos arch and Houston and Rio Grande embayments, and by location of the Wilcox, Vicksburg, and Frio fault zones. Subdivision No. 2 in South Texas, was used to illustrate methods for evaluating bulk volume of sandstone, porosity, fluid pressure, temperature, salinity, and the amount of methane dissolved in formation waters.

825. GGIS-100014/O/ / 12/M/ // //

Title- Progress Report on Shale Electric Log

(Paper B)

Conference- Annual Logging Symposium

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Well logging / Electrical logging /

Abstract by NTIS

A complete electric log may be made from drill cuttings, simultaneously with drilling. The NAU potential, resistivity of a shale water mix, and the matrix resistivity all may be measured, to yield geological as well as drilling information. The water filtered from shale may also be used to measure CAUU, KU, REDOX and cationic potentials. These are useful in determining limey sands and pressure caps for log interpretation, for location of geopressured zones, and for determining hydrocarbon environment. 4 refs.

826. GGIS-100076/R/ / 14/A/ // //

Title- Projection of Attainable Geothermal Energy Development

(Appendix N. in Program Definition for the Development of Geothermal Energy- Appendices, Vol. 3)

Publisher- Jet Propulsion Lab.

Pasadena, California

Publication date- Vol. 3 , 1975

Pagination- 21 Pages

Report/patent- JPL--5040-6 (Vol.3)

Descriptor(s)- / Forecasting / Geophysical surveys / Geopressured systems / Geothermal energy conversion / Geothermal exploration / Geothermal resources / Geothermal systems / Hot dry rock systems / Hydrothermal systems / Land leasing / Planning / Research programs //

Abstract by ERDA

In order to aid in determining a suitable target for the geothermal energy program, an attempt is made to estimate how rapid an increase in use of geothermal energy is possible. Attainable limits for geothermal development and use are

projected through the year 2000 and are summarized by resource type. The projected level of geothermal energy usage by the end of 1985 is modest (i. e., on the order of 6,000 MWE). The potential growth in the post-1985 time period is significant and could approach 140,000 MWE by the YEAR 2000. (MOW)

827. GGIS-100227/J/ / /A/ / / / /

Title- Property Rights to Geothermal Resources

Author(s)- / Sato , S. / Crocker , T. D. /

Journal- Ecol. Law Q.

Publication date- Vol. 6 , Issue 2 , 1977

Pagination- Page 247 , 75 Pages

Descriptor(s)- / Geothermal resources / Imperial Valley / Legal aspects / Licensing / Ownership /

Abstract by TIC

The current status of the property regime governing geothermal resources is examined and alternative regimes are investigated with a view to identifying that system which promotes the most efficient allocation of resources. First, the current status of proprietary claims to geothermal resources is explored. Second, the various property regimes which might be applied to geothermal resources are analyzed and a system based on government licensing is proposed. A brief technical discussion provides the geological and engineering information necessary to an understanding of the article. This is followed by a discussion of the property rights to geothermal resources in California's Imperial Valley. (MHR)

828. GGIS-100227/J/ / /A/ / / / /

Title- Property Rights to Geothermal Resources-

Subtitle- Part Two

Author(s)- / Sato , Sho /

Journal- Ecol. Law Q.

Publication date- Vol. 6 , Issue 3 , 1977

Pagination- Page 481 , 89 Pages

Auxiliary expression(s)-

Illus. / Graph (2) /

Ref.

Descriptor(s)- / Allocations / Efficiency / Geothermal resources / Legal aspects / Property rights /

Abstract by EIC

Allocative regimes for geothermal resources in several western states are examined. Possible alternative models for allocation of geothermal resources are assessed for their economic efficiency. Property regimes based on governmental responsibility to control geothermal resource development through the power to define property rights are considered. On the state level, four models for evaluating the efficiency for potential property regimes are examined; the rule of capture, the reasonable use rule, the correlative rights doctrine, and the appropriation system. An appropriation system that would be

Geopressured Geothermal Bibliography

relatively efficient compared with other allocative regimes is detailed.

829. GGIS-100042/J/ / 205/A/ // //

Title- Proposed Geopressured Energy Investigation

(Reservoirs, Feasibility Economics, Gulf Coastal Plain, and Gulf of Mexico)

Author(s)- / Durham, C. O., JR. /

Journal- Geothermal Energy Magazine

Publication date- Vol. 2, Issue 5, May 1974

Pagination- Page 7, 13 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Gulf Coast / Energy sources / Gulf of Mexico / Ground water / Economic geology / United States / Surveys / Geopressure / Geopressured reservoirs / Possibilities / Economics / Feasibility studies / Continental Shelf / Pressure buildup / Evaluation / Geopressured systems / Geothermal resources / Louisiana / Methane / Power generation / Research programs / Texas /

830. GGIS-100116/O/ / /M/ // //

Title- Prospect for Geothermal Power

Author(s)- / Smith, M. C. /

Publication date- 1974

Pagination- 9 Pages

Report/patent- LA-UR--74-1111 (CONF--740709-2

Available- NTIS

(Paper copy)

(Microform)

Corporate Author- Los Alamos Scientific Lab.
New Mexico, USA

Descriptor(s)- / Dry-steam systems / Forecasting / Geothermal resources / Hot dry rock systems / Natural steam / Power generation / Power potential / Thermal waters / Geothermal energy / Geopressured systems /

Abstract by Author

The relatively small fraction of the earth's crust which is now accessible to man by drilling from the surface contains a supply of thermal energy potentially capable of satisfying the world's total energy needs for many thousands of years. At present, however, only that small fraction of this vast resource is considered useful which exists near the earth's surface in the convenient forms of natural steam or superheated water of relatively low salinity. Research and development are now in progress by both industry and government to learn to use economically the energy contained in the more saline superheated waters, the lower temperature but less highly mineralized natural waters, the combination of heat and temperature and dissolved natural gas contained in geopressured water, and the abundant heat contained in dry hot rock. There is every reason to suppose that the problems associated with utilization of

these energy sources will eventually be overcome. The problems are, however, sufficiently formidable to make it unlikely that even ten years from now, more than 1 to 2% of the United States' requirement for electrical power will be satisfied by energy from geothermal sources. With continued technical and commercial development, this fraction should increase to 15 to 20% of the nation's electrical needs by the year 2000, and should be supplemented by a supply of relatively low-grade geothermal heat sufficient to supply a somewhat larger fraction of the nation's nonelectrical energy requirement.

831. GGIS-100393/O/ / /A/ / / / /

Title- Prospect Areas for Testing Entrained Methane Resources in the Shallow Geopressured and Deep Hydropressured Zones, Texas Gulf Coast

Author(s)- / Weise , Bonnie R. / Allie , Adrienne D. / Bebout , Don G. / Edwards , Marc B. / Gregory , A. Ray / Hamlin , H. Scott / Lockley , James L. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 1, June 1980

Pagination- Page 474, 40 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

78712

(Paper copy)

Local Availability- CES

Sponsor- / Gas Research Inst., Chicago, IL (USA) /

Corporate Author- Texas Univ., Austin

Bureau of Economic Geology

Austin, TX, USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (2) / Map (13) / Figure (7) /

Table

Ref.

Descriptor(s)- / Comparative evaluations / Fairway analysis / Geopressure exploration / Geopressure resources / Geopressured zones / Methane / Production testing / Resource assessment / Sand stone / Site selection / Texas / Cameron Fairway / Corpus Christi Fairway / Distribution / Formation thickness / Frio Formation / Matagorda Fairway / Montgomery Fairway / Kenedy Fairway / Permeability / Wilcox Formation /

Abstract by Author

The primary objective of geological studies of geopressured zones funded by the Gas Research Institute is to identify the most favorable sites for test wells which will be capable of long-term production of methane-bearing water from primarily the shallow geopressured and secondarily the deep hydropressured zones of the Texas Gulf Coast. To facilitate study, four zones within the hydropressured and geopressured Tertiary section were defined as follows: (1) the A zone, or deep hydropressured zone below depths of 4,500 ft (1,370 m), in which the fluid pressure

gradient is 0.465 psi/ft (10.5 kPa/m), (2) the B zone, in which fluid pressure gradients are greater than 0.465 psi/ft (10.5 kPa/m) but less than 0.7 psi/ft (15.8 kPa/m), (3) the C zone, in which fluid pressure gradients are greater than 0.7 psi/ft (15.8 kPa/m) and fluid temperatures are less than 300 DEG F (149 DEG C), and (4) the D zone, in which fluid pressure gradients are greater than 0.7 psi/ft (15.8 kPa/m) and temperatures are greater than 300 DEG F (149 DEG C). This study concentrates on the A, B and C zones; the D zone has been the subject of previous studies of geopressured geothermal energy. Delineation of the four zones on regional cross sections and a survey of sandstone distribution defined sandstone-rich corridors for each of the zones. Net-sandstone maps defined high-sandstone fairways within the corridors. These fairways were ranked on the basis of net-sandstone thickness, areal sandstone distribution, average sandstone bed thickness, permeability, and coincidence with fairways of other zones. The most prospective fairways within the Frio Formation are Cameron, Kenedy, Corpus Christi, and Matagorda; the Montgomery Fairway is within the Wilcox Group. One or two prospect areas within each fairway are being studied in detail. Several sites for wells which will test the various pressure zones will be selected within the prospect areas.

832. GGIS-100352/J/ / /A/ / / / /

Title- Prospects for Geothermal Energy Recovery

Author(s)- / Geertsma, J. /

Journal- Erdool-Erdgas-Z. Int. Ed.

Publication date- Vol. 4, Issue 2, 1978

Pagination- Page 33, 6 Pages

Corporate Author- Koninklijke Shell

Lab.

Amsterdam, Netherlands

Auxiliary expression(s)-

Illus. / Diagram (4) / Graph (3) /

Table

Ref.

Descriptor(s)- / Cost / Europe / Financial incentives / Geopressured reservoirs / Geothermal energy / Hot dry rock systems / Hot water systems / Uses / Vapor dominated systems / Well drilling / Geothermal space heating / Greenhouses /

Abstract by Energyline

Geothermal energy resources in western Europe are available from vapor-dominated systems, liquid-dominated systems, geopressured reservoirs, and hot dry rock regions. The incentives for geothermal energy production in western Europe include increasing prices of conventional energy and the potential for efficient application of geothermal power to domestic energy needs; constraints include high drilling costs and the short productive lifetime of geothermal wells. The technical feasibility of recovering geothermal energy is examined.

833. GGIS-100432/R/ / /M/ / / / /

Title- Prospects for Improvement in Geothermal Well Technology and Their Expected Benefits

Publication date- June 1978

Pagination- 138 Pages

Report/patent- HCP/T4014-04

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy
EG-77-C-01-4014 /

Corporate Author- Mitre Corp.
McLean , VA , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (15) /

Table

Ref.

Descriptor(s)- / Cost / Cost benefit analysis / Drilling equipment / Economics / Environmental impact / Forecasting / Geopressure resources / Geothermal drilling / Geothermal industry / Geothermal wells / Performance / Research programs / Well design /

Abstract by Author

This study reviews performance restrictions on current geothermal drilling technology and their impact on drilling costs, with the consequent impact on electric power costs. Sensitivities of drilling costs to changes in drilling performance are analyzed. A programmatic goal for improving drilling performance is offered. The likely cost savings to the nation if the goal is attained are estimated through the use of a geothermal well drilling scenario for the 1978-1990 period, which was derived from DOE's geothermal power on-line scenario. The present worth of the expected savings stream (benefit) is offered as a point of departure for justifying programmatic costs for improving drilling technology.

834. GGIS-100267/B/ / /A/ / / / /

Title- Psychosocial Ecology in the Development of Resources:

Subtitle- Psychosocial Ecology in Geothermal Development

Author(s)- / Ruzicka , William J. / Stolesen , Kay /

Publisher- Geothermal World Publications

Reseda, California

Publication date- 1977

Pagination- Page 219 , 6 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Energy source development / Environmental effects / Geothermal energy / Social impact / Socio-economic factors /

Abstract by TIC

Geopressured Geothermal Bibliography

A proposed model of how the development of a natural resource (geothermal energy) affects and is affected by the human environment (psychosocial ecology) is described. Data obtained by a variety of methods would be assessed and interpreted; conclusions would be based on consensual and divergent evaluation by adversary groups.

835. GGIS-100407/O/ / /A/ // //

Title- Public Acceptance and Support for Geothermal Resource Development in the 1980s

Subtitle- An Issue Deserving Industry Concern and Action

Author(s)- / Julian , R. Keith / Bachrach , Arrie /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

**Publisher- Geothermal Resources Council
Davis, CA**

Publication date- Vol. 4 , 1980

Pagination- Page 789 , 4 Pages

**Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts**

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Ref.

**Descriptor(s)- / Commercialization / Development / Energy source
development / Environmental effects / Geothermal energy /
Geothermal industry / Industry / Planning / Public opinion /
Public relations / Recommendations /**

Abstract by GGIS

Concern for public support of the geothermal industry is expressed in this article. Recent criticism of energy industries has focused on environmental issues, and though the geothermal industry has been spared the harsh criticism others have received, it has not received positive support. Public response is of particular concern to the industry because of the tradeoffs involved in recovering geothermal energy and preserving the natural environment. The problem, then, is how to redirect the public attitude and gain support and acceptance of geothermal projects. General conclusions regarding public acceptance and recommendations for an industry sponsored program to encourage public acceptance form the body of this article.

836. GGIS-100024/B/ / 11/A/ // //

Title- Quantitative Determination of Reservoir Pressure from Conductivity Log

(Paper 3 in Abnormal Subsurface Pressure- Selected Papers from AAPG Bulletin)
 Publisher- American Association of Petroleum Geologists
 Publication date- Vol. 11 , 1974
 Pagination- Page 37 , 10 Pages
 Auxiliary expression(s)-
 Illus.
 Descriptor(s)- / Acadia Parish / Depth / Electric conductivity / Electrical logging / Geopressured zones / Induction logging / Jefferson Davis Parish / Lafayette Parish / Louisiana / Pressure gradients / Reservoir pressure / Shale /
 Abstract by Author
 Use of the conductivity curve of the induction-electrical log to define the depth at which a bore hole enters an abnormally pressured section, as outlined by Wallace (1964), prompted the writer to attempt to develop a method for making quantitative pressure determinations from the conductivity curve. A method of plotting conductivity readings of clean shales vs. depth was devised. This plot shows that a sloping straight line can be drawn through the points in the known normally pressured section, whereas the points in the abnormally pressured zone deviate toward higher conductivity. Causes for the straight line and the deviating portions of the plot were analyzed and it was concluded that the magnitude of the conductivity deviation is primarily a function of the pressure abnormality. Plotting of pressure gradients (calculated from measured reservoir pressure and depths) vs. conductivity deviation in 41 abnormally pressured reservoirs in coastal and offshore Louisiana resulted in a basic curve which can be used to determine approximate pressures in future wells where electric logs can be made available but actual pressure measurements are lacking. An example of the use of this curve is given for the case where a well passes out of an abnormally pressured section into a normally pressured zone. The lower pressures in the normally pressured zone are masked by the high mud weights required to hold the upper, higher pressures but can be detected by the proposed method.

 837. GGIS-100190/ / / /A/ / / / /

Title- R & D Status Report-

Subtitle- Fossil Fuel and Advanced Systems Division

Author(s)- / Balzhiser , Richard E. /

Journal- EPRI J.

Publication date- Vol. 3 , Issue 4 , May 1978

Pagination- Page 38 , 5 Pages

Corporate Author- Electric Power Research Inst.

Palo Alto , California , USA

Auxiliary expression(s)-

Illus. / Photo. (1) / Diagram (3) / Graph (1) /

Descriptor(s)- / Binary cycles / Economics / Geopressure resources / Geothermal brines / Scaling / Cooling systems / Research programs / Gas turbine power generation /

Abstract by Energyline

Recent work and the latest accomplishments of EPRI's fossil fuel and advanced system division are reported. Water-cooled gas

Geopressured Geothermal Bibliography

turbine development, hydrothermal resource development, a subprogram addressing the technical and economic issues of geopressured resources, hydrocarbon turbine binary-cycle properties, improvement of hydrocarbon working fluid data properties, binary-loop test, and scale formation simulation in geothermal brine systems are discussed.

838. GGIS-100190/ / / /A/ / / / /

Title- R & D Status Report-

Subtitle- Fossil Fuel and Advanced Systems Division

Author(s)- / Balzhiser, Richard E. / Roberts, Vase / Hughes, Evan / Golden, Dean /

Journal- EPRI J.

Publication date- Vol. 3, Issue 4, May 1978

Pagination- Page 35, 6 Pages

Corporate Author- Electric Power Research Inst.

Palo Alto, California, USA

Auxiliary expression(s)-

Illus. / Photo. (3) /

Table

Descriptor(s)- / Energy source development / Geopressure resources / Louisiana / Research programs / Technology assessment / Texas / Geothermal brines / Computer calculations / Mathematical models /

Abstract by Energyline

Recent research and the latest developments in EPRI's Fossil Fuel and Advanced Systems Div. are reported. The geothermal program includes elements oriented to hydrothermal and geopressured resource development and to generic research and technology development. The geothermal program is continuing to assess technical issues. One of EPRI's newest research areas is solids by-products and hazardous waste disposal to develop a sensitive method of assessing hazard potential and to find safe disposal systems.

839. GGIS-100528/0/ / /A/ / / / /

Title- Radium and Radon from Gulf Coast Geopressured Aquifers

Author(s)- / Kraemer, Thomas F. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 201, 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AI01-79ET27223 /

Auxiliary expression(s)-

Illus. / Graph (3) /

Table

Ref.

Descriptor(s)- / Aquifers / Fluid properties / Geopressured reservoirs / Gulf Coast / Metals / Radium / Radon / Rare gases /

Abstract by Author

Radium and radon have been determined in fluids produced from geopressured aquifers. Variations in the activity of both elements have been observed during a number of aquifer flow tests. Possible reasons for these variations are discussed, including, for radium, differences in uranium and thorium concentration at various locations in the aquifer and shale dewatering, and for radon, the presence of free gas within the aquifer.

840. GGIS-100995/ / / /A/ / / / /

Title- Radon in Geothermal Reservoir Engineering

Author(s)- / Kruger , Paul /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 383 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Geothermal reservoirs / Measuring methods / Radon / Reservoir engineering / Reservoir properties / Resource assessment /

Abstract by Author

Radon transient analysis appears promising as a method complimentary to pressure transient analysis in the assessment of geothermal reservoirs. Measurement of radon is proving useful in two types of studies in geothermal reservoir engineering: (1) examining the structural properties of the reservoir as they affect the emanation radon from rock to pore fluids, and (2) examining the flow properties of the reservoir as they affect radon migration. Several radon transient tests have been conducted to examine the relationship between radon concentration in wellhead condensate and changes in flow rate. The results indicate that details of reservoir structure and transport may be examined with radon as an internal reservoir tracer.

841. GGIS-100533/O/ / /A/ / / / /

Title- Radon Transect Studies in Vapor- and Liquid-Dominated Geothermal Reservoirs

Author(s)- / Semprini , Lewis / Kruger , Paul /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 344 , 6 Pages

Geopressured Geothermal Bibliography

Local Availability- GGIS

Corporate Author- Stanford Univ.

Dept. of Civil Engineering

CA , USA

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Cerro Prieto Geothermal Field / Comparative evaluations / Downhole sampling / Formation testing / Geopressured reservoirs / Geothermal fluids / Geothermal reservoirs / Geothermal systems / Geysers Geothermal Field / Hot water systems / Natural steam / Vapor dominated systems / Water monitoring / Well information systems / Well monitoring / Well testing /

Abstract by GGIS

A series of radon transect analyses are described that have been conducted at the vapor-dominated reservoirs at The Geysers in California and the liquid-dominated reservoirs at Cerro Prieto in Baja, California. Information sought includes data on the spacial and temporal behavior of geofluids relative to structural and thermodynamic conditions in the reservoir.

842. GGIS-100393/O/ / /A/ / / / /

Title- Ratio of Produced Gas to Produced Water from DOE's Edna Delcambre No.1 Geopressured Geothermal Aquifer Gas Well Test

Author(s)- / Rogers , Leo A. / Randolph , Phillip L. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1273 , 54 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

DE-AC08-78ET27098 /

Corporate Author- Institute of Gas Technology

Chicago , IL , USA

Auxiliary expression(s)-

Illus. / Graph (12) / Map (2) / Figure (6) /
Table

Ref.

Descriptor(s)- / Aquifer tests / Computerized simulation / Drilling / Edna Delcambre No. 1 Well / Flow rate / Gas production / Geopressured wells / Louisiana / Mathematical models / Natural gas deposits / Numerical analysis / Water production /

Abstract by Author

A paper presented by the Institute of Gas Technology (IGT) at the Third Geopressured-Geothermal Energy Conference hypothesized that the high ratio of produced gas to produced water from the No. 1 sand in the Edna Delcambre No. 1 well was due to free gas trapped in pores by imbibition over geological time. This hypothesis was examined in relation to preliminary test data

which reported only average gas-to-water ratios over the roughly 2-day steps in flow rate. Subsequent public release of detailed test data revealed substantial departures from the previously reported computer simulation results. Also, data now in the public domain reveal the existence of a gas cap on the aquifer tested. This paper describes IGT's efforts to match the observed gas/water production with computer simulation. Two models for the occurrence and production of gas in excess of that dissolved in the brine have been used. One model considers the gas to be dispersed in pores by imbibition, and the other model considers the gas as a nearby free gas cap above the aquifer. The studies revealed that the dispersed gas model characteristically gave the wrong shape to plots of gas production on the gas/water ratio plots such that no reasonable match to the flow data could be achieved. The free gas cap model gave a characteristically better shape to the production plots and could provide an approximate fit to the data if the edge of the free gas cap is only about 400 feet from the well. Because the geological structure maps indicate the free gas cap to be several thousand feet away and the computer simulation results match the distance to the nearby Delcambre Nos. 4 and 4A wells, it appears that the source of excess free gas in the test of the No. 1 sand may be from these nearby wells. The gas source is probably a separate gas zone and is brought into contact with the No. 1 sand via a conduit around the No. 4 well.

843. GGIS-100427/R/ / /M/ / / / /

Title- Raytheon Downhole Information System

(Interim Report)

Subtitle- Electromagnetic Lithospheric Information System for Geothermal Drilling

Author(s)- / Kolker , M. / Greene , A. H. / Robertson , J. C. / Grossi , M. D. /

Publication date- March 31 , 1977

Pagination- 100 Pages

Report/patent- C00-2816-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Energy Research and Development Administration, Washington, D.C. (USA). Div. of Geothermal Energy

EY-76-C-02-2816 /

Corporate Author- Raytheon Co.

Advanced Development Lab.

Wayland , MA , USA

Auxiliary expression(s)-

Illus. / Diagram (10) / Photo (4) / Graph (2) / Figure (4) /

Table

Descriptor(s)- / Commercialization / Cost / Cost benefit analysis / Development / Geothermal wells / Lithosphere / Measuring instruments / Optimization / Well drilling / Well information systems / Well monitoring /

Abstract by Author

This report describes the Raytheon Downhole Information System (RDIS) which is designed to reduce the drilling cost and increase the energy yield of deep geothermal wells. The RDIS consists of a downhole sensor package located just above the drill bit, a telemetry link in the drill string, and a well head data management and control system. The RDIS assists the driller to speed drilling, select the best depth locations for geothermal energy exploitation, and protect against catastrophes. Cost savings for drilling optimization are estimated at 24% for a 15,000 foot well under routine conditions. Even greater savings may accrue for catastrophe prevention. The telemetry link operates at an extremely low electromagnetic carrier frequency because propagation occurs directly through the earth. The resulting bit rates, 1 to 10 Hz, are adequate, however, because (1) drilling is characterized by very long time constants, and (2) sensor package data is efficiently preprocessed downhole. Sensors and telemetry units must withstand temperatures in excess of 200 deg C. Studies and tests suggest that a goal of 275 deg C is achievable with modest improvement in available solid state circuitry and power supplies. A three phase development plan is presented to provide a first commercial system in 26 months after start of Phase I field tests.

844. GGIS-100174/J/ / /A/ / / / /

Title- Recent Developments in Geothermal Energy

Author(s)- / Underhill, G. /

Journal- Trans. Am. Nucl. Soc.

Publication date- Vol. 27, 1977

Pagination- Page 8, 2 Pages

Note- See Conf-771109--

Descriptor(s)- / Experimental results / Binary fluid systems / Brines / Flashed steam systems / Geopressed systems / Geothermal energy / Geothermal power plants / Geothermal resources / Government policies / Heat exchangers / Heat transfer / Heber Geothermal Field / Hydrocarbons / Pilot plants / Research programs / Reviews / Steam turbines / Technology assessment / USA / Working fluids /

845. GGIS-100372/R/ / /M/ / / / /

Title- Recommendations for a U. S. Geothermal Research Plan

Subtitle- Volume 1

Author(s)- / Burnham, J. B. / Bloomster, C. H. / Cohn, P. D. / Eliason, J. R. / Peterson, P. L. / Rohrmann, C. A. / Sandness, G. A. / Stewart, D. H. / Wallace, R. W. /

Publication date- December 1975

Pagination- 249 Pages

Report/patent- NSF-RA-N-75-093

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / National Science Foundation
NSF-C839 /

Corporate Author- Battelle Pacific Northwest Labs.
Richland , Washington , USA

Auxiliary expression(s)-
Illus. / Figure (25) /
Table

Descriptor(s)- / Budgets / Cost benefit analysis / Environmental effects / Geopressured systems / Geothermal exploration / Hot dry rock systems / Hot water systems / Institutional aspects / Research programs / Resource assessment / Socio-economic factors / Technology assessment / USA / Vapor dominated systems / Well drilling /

Abstract by Author

Based on data in recent reports and plans for the development of U. S. geothermal resources, a multidisciplinary Battelle-Northwest study team developed a comprehensive research program. Five- and ten-year program plans in this study emphasize critical five-year milestones. Recommended plans are presented here under constraint of three different five-year budgets: \$100, \$300 and \$500 million respectively. Plans are detailed in six resource subprograms: high temperature water, moderate temperature water, hot dry rock, brine, geopressured, and dry steam. Also presented are plans for five subprograms common to all geothermal resources: exploration, assessment, drilling technology, environmental-social, and institutional. A benefit/cost analysis performed in the Battelle-Northwest study shows favorable ratios under all conditions considered; they ranged from 46/1 to 28/1 for the three budget levels at a discount rate of 10 percent. Lower discount rates increase these ratios while higher than 10 percent rates decrease them. The net return (benefit minus cost) analyses show that the high budget has a return of over \$10 billion; the medium and low budgets show lesser returns. Oil equivalents up to 6.6 million barrels per day are found for the high budget by the year 2000 with somewhat less oil savings for the other budget levels. The corresponding impact on the balance of foreign trade for the high budget is \$19 billion per year in the year 2000 at an oil price of \$8 per barrel. On the basis of these analyses the \$500 million budget is recommended by the Battelle-Northwest study team. A rationale is described for the allocation of research funds based on the maximum probability of successful economic demonstration in five years and on the energy potential of the resource. Subprogram plans were first developed using three (high, medium and low) budget definitions. Under these circumstances they represent a cohesive plan for the resource development with little reduction on the research funds. Overlaps between subprograms were then minimized. A comprehensive program plan was finally developed for three specific levels of five-year budget: \$100, \$300 and \$500 million. The specific program plans were recommended on the basis of a probability-payoff model.

846. GGIS-100411/0/ / 1/A/ // //

Title- Reflection Seismic Techniques Locate Geopressured Geothermal Anomalies

Geopressured Geothermal Bibliography

Author(s)- / Aud , B. W. /
Conference- 2nd Geopressured Geothermal Energy Conference
Austin
Texas
USA
Publication date- Vol. 1 , Issue 1 , 1975
Pagination- Page 133 , 12 Pages
Available- Center for Energy Studies)
Available- NTIS
(Paper copy)
(Microform)
Auxiliary expression(s)-
Illus. / Figure (10) / Graph (10) /
Ref.
Discuss.
Descriptor(s)- / Geopressured systems / Geothermal exploration /
Lithology / Measuring methods / Pressure gradients / Pressure
measurement / Seismic surveys / Geophysical exploration /
Seismic methods / Reflection / Uses / Geothermal energy /
Exploration / Geopressure / Data / Interpretation / Texas /
Calculation methods / Continental Shelf / Temperature
measurement / Sonic logging / Louisiana / Logs / Diagrams /
Abstract by ERDA/RECON
Interpretive techniques for predicting abnormal pressure and
relative lithology from velocity analysis of seismic data are
outlined. By use of correlations between high temperature and
abnormal pressure zones, these techniques can be applied to the
exploration of geopressured geothermal anomalies. (LS)

847. GGIS-100571/R/ / /M/ / / / /

Title- Refocused Energy Policy
Subtitle- A Natural Gas Perspective
Author(s)- / Mares , J.W. /
Conference- International Gas Research Conference
Los Angeles
CA (September 28 , 1981)
Publication date- September 1982
Pagination- 9 Pages
Report/patent- CONF-810909-9
Available- NTIS
Sponsor- / Department of Energy, Washington, D.C. (USA) /
Descriptor(s)- / Commercialization / Economics / Energy policy /
Energy source development / Energy sources / Government policies
/ Technology utilization / US DOE /
Abstract by NTIS

The present administration's policy on energy development is
briefly summarized. While the Department of Energy will be
dismantled, several important functions will be preserved and
will continue elsewhere in government. The administration's aim
is not to present an energy blueprint to predetermine solutions,
rather, policy is based on the belief that the marketplace must
be allowed to determine the most economic and durable energy
sources. Revision of the federal leasing policy is discussed.
Free market pricing of oil and gas is another key aspect of the
new energy policy. The development of advanced technology in the

areas of natural gas recovery, methane from coalbed, development of tight sands deposits, geopressed aquifers, and coal gasification is also discussed.

848. GGIS-100411/O/ / 1/A/ // //

Title- Regional Sand Distribution of the Frio Formation, South Texas

Subtitle- A Preliminary Step in Prospecting for Geothermal Energy

Author(s)- / Bebout , D. G. / Agagu , O. K. / Dorfman , M. H. /

Conference- 2nd Geopressed Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 101 , 53 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Auxiliary expression(s)-

Illus. / Figure (28) /

Ref.

Descriptor(s)- / Distribution / Electrical surveys / Geological surveys / Geothermal exploration / Maps / Sand / Shale / Shores / Temperature measurement / Texas / Thickness / Well logging / Wells / Geopressed zones /

Abstract by ERDA/RECON

A geologic study is made of the main sand trends of the Frio Formation. Three major Frio Sand depocenters have been delineated: (1) Southeastern Hidalgo, Western Willacy, and Western Cameron Counties; (2) Eastern Kenedy and Kleberg Counties; and (3) North-Central Nueces County. Sand percentage maps were made based on data obtained from the interpretation of the spontaneous wells spaced approximately 5 to 10 miles apart throughout the South Texas area. Potential geothermal areas were delineated from correlations of isothermal and sand-percentage maps. (LS)

849. GGIS-100058/J/ / /A/ // //

Title- Regional Tectonic Features of Inner Gulf Coast

Author(s)- / Woodruff , C.M. /

Publication date- Vol. 78 , Issue 45 , November 10 , 1980

Pagination- Page 264 , 4 Pages

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Map (3) /

Ref.

Descriptor(s)- / Commercialization / Fault zones / Geothermal resources / Market / Mississippi / Tectonics / Texas /

Abstract by FC

The inner Gulf Coast region that runs through Central Texas is distinguished by three types of tectonic features that may indicate potential geothermal resource areas; loci of major

Geopressured Geothermal Bibliography

crustal discontinuities; normal faulting zones; and areas denoted by volcanic rocks. These geographic features are discussed with regard to geothermal possibilities.

850. GGIS-100150/R/ / /M/ / / / /

Title- Regional Tertiary Cross Sections

Subtitle- Texas Gulf Coast

Author(s)- / Bebout , D. G. / Luttrell , P. E. / Seo , J. H. /

Publication date- 1976

Pagination- 10 Pages

Report/patent- NP-22410

Available- Bureau of Economic Geology

University of Texas at Austin

University Station

Box X

Austin

Texas

U. S. A.

78712

(Paper copy)

Corporate Author- Texas University, Austin

Bureau of Economic Geology

Austin , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (7) /

Table

Descriptor(s)- / Electrical surveys / Frio Formation / Geographical distribution / Geologic cross sections / Geology / Geopressured reservoirs / Geopressured systems / Gulf Coast / Maps / Paleontology / Regional analysis / Sand / Shale / Tertiary Period / Texas / Wells / Distribution / Sandstone /

Abstract by DOE/RECON

Regional studies of the Frio Formation along the Texas Gulf Coast were conducted to evaluate potential geothermal energy from deep, geopressured sandstone reservoirs. Published regional cross sections, unpublished cross sections provided by several major oil companies, and extensive micropaleontological and electrical-log files at the Bureau of Economic Geology served as basic data. These sections are meant to show gross regional distribution of sand and shale facies both laterally and vertically throughout the entire Tertiary section along the Texas Gulf Coast.

851. GGIS-100393/O/ / /A/ / / / /

Title- Reinjection of Fluids into a Producing Geopressured Reservoir

Author(s)- / Garg , Sabodh K. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 2 , June 1980

Pagination- Page 1000 , 31 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS

Austin
 TX
 78712
 (Paper copy)
 Local Availability- CES
 Sponsor- / Department of Energy, Washington, DC (USA)
 DE-AC-08-79ET27202 /
 Corporate Author- Systems, Science and Software
 La Jolla , CA , USA
 Auxiliary expression(s)-
 Illus. / Diagram (1) / Graph (9) /
 Table
 Ref.
 Descriptor(s)- / Brines / Compressibility / Geopressured reservoir /
 Injection pumps / Injection wells / Methane / Permeability /
 Productivity / Simulation /
 Abstract by Author
 A reservoir simulator (MUSHRM) was employed to examine the effects of reinjecting the processed brine on the long-term performance of a representative geopressured reservoir. These calculations indicate that reinjection can be used to substantially increase methane and brine production. The results suggest that power requirements for reinjection pumps can be met either by burning approximately two-thirds of the produced methane (which may in some cases negate the benefits of reinjection as far as methane production is concerned) or by using the heat of the produced brine (320 DEG F) to generate electric power. Assuming that electric power produced from hot brine is used to reinject the processed fluids, it appears that reinjection is a viable production strategy for increasing methane recovery from geopressured systems. The attractiveness of reinjection to recover methane increases with increasing formation permeability and decreasing formation compressibility.

852. GGIS-100488/G/ / /C/ / / / /

Title- Relation of the Altitude of the Top of the Geopressured Zone to the Altitude of the Top of the Carrizo-Wilcox Aquifer System in Texas
 (Plate 1)
 Conference- Third Geopressured-Geothermal Energy Conference
 Lafayette
 LA (November 16 , 1977)
 Pagination- 1 Pages
 Note- Hydrogeology by J.B. Wesselman
 Local Availability- GGIS
 Sponsor- / Department of the Interior, United States Geological Survey /
 Corporate Author- Peppard-Souders and Associates
 Houston , TX
 Descriptor(s)- / Altitude / Aquifers / Contour maps / Document types /
 Faults / Geologic structures / Geology / Geopressured zones /
 Hydrogeology / Maps / Salt domes / Texas / Wilcox Formation /
 Abstract by GGIS
 This map is drawn such that the relation of the altitude of the top of the geopressured zone to the altitude of the top of

Geopressured Geothermal Bibliography

the Carrizo-Wilcox Aquifer System is shown by means of structure and geopressure contours. The area where the top of the geopressured zone occurs within the Carrizo-Wilcox Aquifer System is represented by shading. Also shown on the map are the faults that lie within the region, the salt domes that are found within the area, and the outcrop of the Carrizo-Wilcox Aquifer System. The scale of the map is 1:750,000.

853. GGIS-100053/J/ / /A/ // //

Title- Relationship Between Hydrocarbon Accumulation and Geopressure and its Economic Significance

Author(s)- / Fertl, W.H. / Timko, D.J. /

Publication date- Vol. 23, Issue 8, August 1971

Pagination- Page 923, 11 Pages

Corporate Author- Continental Oil Co.

Houston, Texas, USA

Auxiliary expression(s)-

Illus. / Figure (19) /

Table

Ref.

Descriptor(s)- / Gas production / Geopressured zones / Gulf Coast / Natural gas deposits / Oil production / Petroleum deposits / Reservoir engineering / Reservoir pressure / Well drilling / Well logging /

Abstract by Compendex

Commercial oil and gas accumulations appear to be related to the pressure distribution in the Gulf Coast area. The extent of overpressures appears to have an important bearing on the accumulation of oil and gas and, as a result, on the related drilling, production, and reservoir engineering. The magnitude of porefluid pressures as derived from conventional well logs correlates very well with the distribution and type of hydrocarbons. This knowledge can be used in economic decision-making. Several field examples and case histories are given for illustration.

854. GGIS-100058/J/ / 6802/A/ // //

Title- Relationship Between Hydrocarbon Accumulation and Geopressure and Its Economic Significance

Author(s)- / Fertl, W. H. / Timko, D. J. /

Journal- Oil and Gas Journal

Publication date- Vol. 68, Issue 2, February 12, 1970

Pagination- Page 62, 6 Pages

Descriptor(s)- / Oil well drilling / Blowout preventers / Well logging / Radioactive logs /

Abstract by NTIS

The best approach in detecting and evaluating geopressures is to study a combination of several measured properties of the formation, i. e., bulk density, conductivity, resistivity as well as neutron measurements. Salinity variations, drill penetration rate, borehole temperature, and presence of gas in

mud supply are also indices for determination of abnormal geopressures. 16 refs.

855. GGIS-100893/ / / /A/ / / / /

Title- Relationships of Stationary Flow Processes in Open Surface and Overpressure Groundwater in Anisotropic and Inhomogenous Medium

Author(s)- / Mauersberger, P. /

Publication date- Vol. 82, Issue 2, 1973

Pagination- Page 115, 6 Pages

Language- German

Descriptor(s)- / Fluid flow / Geopressure / Ground water /

856. GGIS-100407/0/ / /A/ / / / /

Title- Relative Permeability Measurements of Rocks from the Texas Gulf Coast Geopressured-Geothermal Reservoir at Low Free Gas Saturations

Author(s)- / Morita, Nobuo / Roberts, Brian W. / Gray, Kenneth E. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9, 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4, 1980

Pagination- Page 369, 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasek W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (4) /

Table

Ref.

Descriptor(s)- / Analysis / Brazoria County / Comparative evaluations / Equations / Equipment / Gas saturation / Geopressured reservoirs / Gulf Coast / Measuring instruments / Performance / Permeability / Rock properties / Sampling / Sandstone / Texas /

Abstract by GGIS

Water production from a geothermal reservoir causes evolution of natural gas contained within the reservoir. This trapped free gas decreases the reservoir permeability to water and lowers production rate. In this study special equipment was used to measure the effect of low free gas saturation on the permeability of water, the ultimate purpose being to predict geopressured geothermal reservoir performance. Rock samples for

Geopressured Geothermal Bibliography

this study were obtained from the geopressured geothermal reservoir underlying Brazoria County, Texas. Specifics of the investigation include the effects of hysteresis, of vertical and horizontal bedding planes, of the magnitude of absolute permeability, and the initial fluctuation of relative permeability with increasing free gas saturation.

857. GGIS-100353/ / / /M/ / / / /

Title- Report on a Focus Group Discussion

Author(s)- / Christopherson , G. R. /

Publication date- November 10 , 1978

Pagination- 44 Pages

Report/patent- DOE/TIC-10023

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U. S. Department of Energy

EV-78-C-01-6388 /

Corporate Author- Mathematica Policy Research, Inc.

Princeton , New Jersey , USA

Descriptor(s)- / Aquifers / Capital / Commercialization / Economic policies / Financial incentives / Geopressure resources / Institutional aspects / Investment / Natural gas / Regulations / Research programs / Well drilling / National government /

Abstract by TIC

Three separate technologies were discussed but, because of the background of the discussants, the greater part of the discussion focused on geopressure aquifers. In general, there was considerable agreement with regard to the level and types of technological and economic uncertainty, the institutional barriers, and the role that the federal government should take in enhancing commercialization. The resource is considered to be vast and if the market were allowed to operate freely the demand for the gas would be considerable. It was estimated that in a free market an annual demand of up to 30 trillion cubic feet could be expected in the near future. The industry representatives think that the market demand would be greater than estimates compiled by the government because those demand estimates were influenced downward by assumptions of relatively constrained supply. It was agreed that the economic incentives available to industry, given the current regulation of price, are not sufficient to induce significant risk capital into well drilling in search of geopressurized gas. A common industry position is that the government needs to provide front-end funds to at least assist in well drillings, or for additional research within existing wells. The goal of this research would be to compile necessary engineering data to reduce the technological uncertainty and provide a basis for economic decision-making on possible risk-capital expenditures by industry. Industry opinion at this time is that the ceiling price of gas is going to have to be above the current price to induce some investment decisions in favor of these technologies over alternative uses of risk capital.

858. GGIS-100460/R/ / /M/ / / / /

Title- Research and Development of Improved Geothermal Well Logging Techniques, Tools and Components
(Final Report)

Subtitle- (Current Projects, Goals and Status)

Author(s)- / Lamers , Michael D. /

Publication date- January 1978

Pagination- 60 Pages

Report/patent- SAN/1380-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy

EG-77-G-03-1380 /

Corporate Author- Measurement Analysis Corp.

Palos Verdes Estates , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (8) / Graph (1) /

Table

Ref.

Descriptor(s)- / Design / Development / Feasibility studies / Geothermal wells / Materials testing / Performance / Research programs / Well logging / Well logging equipment /

Abstract by Author

Abstract by Author

One of the key needs in the advancement of Geothermal Energy is availability of adequate subsurface measurements to aid the reservoir engineer in the development and operation of geothermal wells. This report describes some current projects being sponsored by the U.S. Department of Energy's Division of Geothermal Energy pertaining to the development of improved well logging techniques, tools and components. The report attempts to show how these projects contribute to improvement of geothermal logging technology in forming key elements of the overall program goals.

859. GGIS-100528/O/ / /A/ / / / /

Title- Reservoir Engineering and Computer Model Analyses of Flow Tests on the Miogyp Sand

Subtitle- Sweet Lake Geothermal-Geopressured Prospect

Author(s)- / Gould , T.L. / Kenner , C.B. / Clark , J.D. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 317 , 7 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-80ET27217 /

Auxiliary expression(s)-

Geopressured Geothermal Bibliography

Illus. / Figure (3) / Graph (7) /
Table
Ref.

Descriptor(s)- / Analysis / Computer codes / Data analysis / Flow
models / Frio Formation / Reservoir engineering / Testing /

Abstract by Author

Engineering analysis and interpretation of two flow tests on the fifth sand of MG-T/DOE Amoco Fee No. 1 well have been completed. The gas-water ratio of the fifth sand was reported to be about 10.7 scf/bbl, which is very undersaturated. Testing of a single zone is inconclusive as to the commercial viability of the well. Testing of other zones for both productive capacity and solution gas-water ratio is continuing at this time.

860. GGIS-100995/ / / /A/ / / / /

Title- Reservoir Engineering Aspects of Fluid Recharge and Heat
Transfer in Geothermal Reservoirs

Author(s)- / Miller , F.G. / Cinco , H. / Ramey , H.J. Jr. / Kucuk ,
F. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 449 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Stanford Univ.

Stanford , California , USA

Auxiliary expression(s)-

Illus. / Graph (2) / Diagram (1) /

Ref.

Descriptor(s)- / Geothermal reservoirs / Heat transfer / Natural
recharge / Reservoir engineering / Water influx /

Abstract by Author

Natural recharge of fluid filled geothermal reservoirs is shown to be important in the development of these reservoirs and in increasing geothermal energy reserves. Research contributions on methods for calculating water influx and heat transfer in petroleum reservoirs are discussed. The need to forecast the performance of geothermal fluid reservoirs subject to water influx is emphasized.

861. GGIS-100528/O/ / /A/ / / / /

Title- Reservoir Engineering Aspects of Geopressured-Geothermal
Reservoir Production

Author(s)- / MacDonald , Robert C. / Peters , Ekwere /

Conference- Fifth Conference on Geopressured-Geothermal Energy (
October 13 , 1981)

Publication date- 1981

Pagination- Page 33 , 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA) /

Auxiliary expression(s)-

Illus. / Graph (3) /

Ref.

Descriptor(s)- / Geopressed reservoirs / Geothermal brines / Pleasant Bayou No. 2 Well / Productivity / Reservoir engineering / Reservoir fluids / Reservoir properties / Simulation / Texas / Well testing /

Abstract by Author

Reservoir phenomena believed to be important in the production of geopressed-geothermal brines are described. These include formation compaction, localized gas evolution, shale dewatering and heterogeneities. Computational techniques for predicting reservoir behavior and analyzing reservoir production response are discussed and illustrated.

862. GGIS-100533/0/ / /A/ / / / /

Title- Reservoir Exploration/Testing by Elastomechanical Methods

Author(s)- / Bodvarsson, Gunnar /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16, 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 338, 6 Pages

Local Availability- GGIS

Corporate Author- Oregon State Univ.

School of Oceanography

Corvallis, USA

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Engineering / Engineering geology / Equations / Exploration methods / Formation damage / Geophysical surveys / Geopressed gradients / Geopressed reservoirs / Geothermal gradient surveys / Hot water systems / Pressure measurement / Production logging / Reservoir engineering / Reservoir properties / Rock mechanics / Thermal exploration methods / Water production / Well information systems / Well testing /

Abstract by GGIS

Presented here is a preliminary evaluation of the potential of the elastomechanical methods in practical reservoir engineering and related areas. Assuming simple relevant situations, field signal strength is estimated and compared to other ground surface data of interest in reservoir monitoring. This discussion is limited to vertical ground displacement and tilt signals because of the difficulty in observing surface strain.

863. GGIS-100411/0/ / 1/A/ / / / /

Title- Reservoir Mechanics of Geopressure Aquifers

Author(s)- / Bernard, William J. /

Geopressured Geothermal Bibliography

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1, Issue 1, 1975

Pagination- Page 157, 13 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Aquifers / Energy yield / Equations / Flow rate /
Geopressured systems / Geothermal wells / Mathematical models /
Performance / Power potential / Geothermal energy / Production /
Measuring methods / Prediction / Geopressure / Reservoir rocks /
Engineering geology / Geopressured reservoirs / Overburden
pressure / Petroleum / Reviews /

Abstract by Author

To evaluate the practicality of producing energy from
geopressured aquifers, methods to predict energy-production
rates are necessary. This paper reviews established
petroleum-reservoir engineering techniques as applied to
geopressured systems. Also, the effects of dissolved natural
gas, shale water influx, and abnormally high rock
compressibilities on aquifer behavior are discussed.

864. GGIS-100541/R/ / /M/ / / / /

Title- Reservoir Performance in Viscoelastic Porous Media

Author(s)- / Rago, F.M. / Okhuma, H. / Sepehrnoori, K. / Thompson,
T.W. /

Publication date- January 1982

Pagination- 32 Pages

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA) /

Corporate Author- Texas Univ.

Center for Energy Studies

Austin, USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Figure (1) / Graph (7) /

Ref.

Table

Descriptor(s)- / Brazoria County / Dissolved gases / Equations / Fluid
properties / Formation testing / Geopressured reservoirs /
Mathematical methods / Numerical analysis / Physical properties
/ Texas /

Abstract by Author

The mass balance equations for a two-phase two-component
fluid system are written for viscoelastic porous media. The
resulting equations are approximated by finite differences and
the resulting numerical simulator is used to conduct a
sensitivity study on the effects of uniaxial viscoelastic
deformation in geopressured aquifers. Results of this study
indicate that viscoelastic deformation may have considerable
influence on the pressure maintenance of these aquifers. A

erical model of the geopressured aquifer in Brazoria County, as, is constructed and the numerical simulator is used to dict the ultimate recovery of solution gas from this coelastic geopressured aquifer.

IS-100411/0/ / 1/A/ // //

Reservoir Research and Technology

. Session)

)- / Podio , Agosto L. /

ce- 2nd Geopressured Geothermal Energy Conference

tin

as

ion date- Vol. 1 , Issue 1 , 1975

on- Page 155 , 86 Pages

e- Center for Energy Studies)

e- NTIS

per copy)

croform)

y expression(s)-

us. / Map (2) / Photo (3) /

or(s)- / Geothermal energy / Geo brine / Texas / Geothermal
lling / Mathematical models / Resource / Unconventional
gy / Proceedings /
by Energyline

Methods of predicting energy production rates are needed to
assess the feasibility of obtaining energy from geopressured
ifers. Established petroleum reservoir engineering
niques applied to geopressured systems are reviewed. The
ects of dissolved natural gas, shale water influx, and
ormally high rock compressibilities on aquifer behavior are
essed. The energy potential of geothermal waters in the
opressed reservoirs of the Gulf Coast ultimately depends on
yield of wells tapping these reservoirs. Possible well
lds in a geopressured reservoir in Texas are analyzed.
emporary well information systems applied to geopressured
ervoir description are discussed with emphasis on useful
pment and procedures. Methods of sampling and evaluating
opressed geothermal aquifers in extreme southern Texas are
eyed. The governing equations describing mass and energy
isport in geopressured geothermal reservoirs are studied. A
y interacting rock fluid system with rock porosity,
eability, and thermal conductivity dependent on the fluid
rock stresses is advanced. (Numerous diagrams, numerous
hs, 2 maps, 3 photos, numerous references)

S-100411/0/ / 1/A/ // //

Reservoir Research and Technology

Volume)

Geopressured Geothermal Bibliography

Author(s)- / Podio , Augusto L. / Gray , Kenneth E. / Isokrari , Ombo F. / Knapp , Roy M. / Silberberg , Irwin H. / Thompson , Thomas W. /

Conference- 2nd Geopressured Geothermal Energy Conference
Austin
Texas
USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 365 , 365 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Auxiliary expression(s)-

Illus. / Diagram (42) / Graph (42) / Map (3) / Photo (2) /

Table

Ref.

Descriptor(s)- / Geothermal energy / Geo brine / Geothermal drilling / Geothermal wells / Proceedings / Mathematical models / Unconventional energy / Water sampling / Texas / Gulf of Mexico / Rock / Temperature measurement / Flow rate / Economics / Theoretical treatments / Well logs / Methane solubility / Pressure measurement / Computer codes / Geopressured systems / Maps / Tables / Diagrams / Drilling / Well completion data / Subsidence / Cost / Rock properties / Computer calculations / Pore pressure / Well head pressure /

Abstract by Energyline

Advanced research and technology in well drilling, well design, well completion, well performance, data acquisition, and reservoir performance are explored, and preliminary plans with cost estimates for a geothermal test well are developed. Available drilling and completion technology and equipment are adequate to successfully complete a geopressured geothermal well. Certain long lead-times can be determined based on the approximate site definition, but a detailed program design requires complete definition of the test site. Development of a geothermal reservoir simulator is necessary to properly design the test sequence and to evaluate reservoir performance. Recommendations for reservoir performance are also discussed. (42 diagrams, 41 graphs, 3 maps, 2 photos, 80 references, 30 tables)

867. GGIS-100407/O/ / /A/ / / / /

Title- Reservoir Response to Tidal and Barometric Effects

Author(s)- / Hanson , Jonathan M. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 337 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-48 /

Auxiliary expression(s)-

Illus. / Graph (3) /

Table

Ref.

Descriptor(s)- / Data analysis / Downhole sampling / Elasticity /
Evaluation / Fluid pressure / Geothermal fields / Hydraulics /
Mathematical models / Models / Pore pressure / Raft River KGRA /
Reservoir properties / Salton Sea / Sandstone / Well testing /

Abstract by GGIS

In this research downhole and wellhead pressure data have been gathered from seven wells, and preliminary results are reported with respect to potential application of tidal and barometric reservoir response for evaluating in situ reservoir parameters. Tidal strain and barometric pressure affect porous reservoirs such that the effective pore volume is dilated or constricted. Data reflecting these conditions have the advantage of being cost effective because the data collection requires minimal downhole and surface equipment. This method of acquiring reservoir information complements conventional well testing methods by providing data interpretation free from the problems of temperature dependent fluid viscosity and pressure effects caused by the usual necessity of fluid production or injection. Also, fluid flow within the reservoir is minimal, so turbulence that may occur during conventional pump tests is unlikely. Conclusions indicate favorable comparison between porosity-total compressibility product results obtained from conventional tests and those results based on tidal strain response; also, there is potential for using the Auto Regressive Integrated Moving Average (ARIMA) to evaluate reservoir parameters based on reservoir response to barometric loading.

868. GGIS-100448/R/ / /M/ / / / /

Title- Residential Space Heating Cost

Subtitle- Geothermal vs. Conventional Systems

Author(s)- / Engen, I. A. /

Publication date- February 1978

Pagination- 46 Pages

Report/patent- TREE-1182

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of

Geothermal Energy

EY-76-C-07-1570

Geopressured Geothermal Bibliography

Sponsor- / Department of Energy, Idaho Falls, ID (USA). Idaho
Operations Office /

Corporate Author- EG and G Idaho, Inc.
Idaho Falls , USA

Auxiliary expression(s)-
Illus. / Diagram (1) / Figure (1) / Graph (6) /
Table
Ref.

Descriptor(s)- / Charges / Cost / District heating / Economic analysis
/ Feasibility studies / Geothermal space heating / Resource
development / Space heating / Comparative evaluations /

Abstract by Author

This report analyzes the operating characteristics and economies of several representative space heating systems. The analysis techniques used in this report may be applied to a larger variety of systems than considered herein, thereby making this document more useful to the residential developer, heating and ventilating contractor, or homeowner considering geothermal space heating. These analyses are based on the use of geothermal water at temperatures as low as 120 deg F in forced air systems and 140 deg F in baseboard convection and radiant floor panel systems. This investigation indicates the baseboard convection system is likely to be the most economical type of geothermal space heating when geothermal water of at least 140 deg F is available. Heat pumps utilizing water near 70 deg F, with negligible water costs, are economically feasible and they are particularly attractive when space cooling is included in system designs. Generally, procurement and installation costs for similar geothermal and conventional space heating systems are about equal, so geothermal space heating is cost competitive when the unit cost of geothermal energy is less than or equal to the unit cost of conventional energy. Guides are provided for estimating the unit cost of geothermal energy for cases where a geothermal resource is known to exist but has not been developed for use in residential space heating.

869. GGIS-100411/0/ / 1/A/ // //

Title- Resource Assessment
(2. Volume)

Author(s)- / Bebout , D. G. /

Conference- 2nd Geopressured Geothermal Energy Conference
Austin
Texas
USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 53

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Auxiliary expression(s)-

Illus. / Diagram (13) /

Illus. / Map (9) /

Ref.

Table

Descriptor(s)- / Geothermal resources / Geothermal energy /
 Geothermal brines / Texas / Gulf of Mexico / Geothermal wells /
 Proceedings / Faults / Geological setting / Lithology /
 Permeability / Temperature measurement / Site selection / Fluid
 pressure / Geopressed systems / Drilling / United States / Maps
 / Cross sections / Tables / Diagrams /

Abstract by Energyline

Subsurface techniques for locating and evaluating geopressed geothermal reservoirs, previously applied in petroleum exploration, are described and used to determine the extent and location of potential geothermal reservoirs along the Texas Gulf Coast. A potential reservoir should have at least 3 CU. MI., a subsurface fluid temperature (uncorrected) of at least 250 degrees F., and a permeability above 20 millidarcies. The Gulf Coast geologic framework is outlined, wells analyzed are tabled, and potential geothermal corridors are mapped. Site selection is also discussed. (13 diagrams, 9 maps, 14 references, 4 tables)

 870. GGIS-100411/0/ / 1/A/ // //

Title- Resource Assessment

(2. Session)

Author(s)- / Groat , Charles C. /

Conference- 2nd Geopressed Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 99 , 55 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Descriptor(s)- / Geothermal resources / Texas / Geology / Seismology /
 Proceedings /

 871. GGIS-100224/B/ / /A/ // //

Title- Resource Development/Utilization

(In Geology of Alternate Energy Resources in the South-Central
 United States)

Subtitle- Development and Utilization of Geopressed Geothermal
 Resources in the South-Central United States

Author(s)- / Lombard , D. B. /

Publisher- Houston Geological Society

Houston, Texas

Publication date- 1977

Pagination- Page 275 , 21 Pages

Available- Geothermal Information Services

318 Cherrywood St.

West Covina

CA

91791)

Geopressured Geothermal Bibliography

Descriptor(s)- / Energy source development / Direct energy utilization / Geopressure resources / Geopressured reservoirs / Geothermal energy conversion / Institutional aspects / Legal aspects / Power generation / Reservoir properties / Uses /

Abstract by TIC

The geopressured geothermal aquifers of the South-Central United States represent a potentially enormous store of mechanical, thermal and chemical energy. Nonetheless, it is not yet certain whether that energy can be utilized in ways that are technically sound, economically attractive and environmentally clean. The principal issues and concerns related to the possible recovery and conversion of energy from the geopressured resource are reviewed. Geopressured brines occur in well-defined sandstone formations, or reservoirs, which vary widely in size, temperature, and productive capacity. Plants capable of generating electricity from geopressurized "fuel" would require certain minimum reservoir properties. To what extent Gulf Coast geopressured aquifers meet these criteria has not yet been determined. Less stringent reservoir requirements would govern the direct application of geopressured heat to industrial and agricultural processes. The technical and economic feasibility of systems proposed for the extraction, conversion, and utilization of geopressured energy are examined in relation to resource properties. Concepts for the conversion of the mechanical and thermal energy components to electricity are discussed, and several approaches to nonelectric energy utilization are noted. A brief review highlights the importance of legal and institutional issues that may impede the development of geopressured resources. It is concluded that a better understanding of geopressured resource characteristics is prerequisite to the resolution of most outstanding concerns, both technical and nontechnical.

872. GGIS-100461/R/ / /M/ / / / /

Title- Resource Utilization Efficiency Improvement of Geothermal Binary Cycles--Phase II

(June 15, 1976 - December 15, 1976)

Subtitle- Semi-Annual Report

Author(s)- / Starling , Kenneth E. / Fish , Larry W. / West , Harry / Johnson , David W. / Iqbal , Khan Zafar / Lee , Chang-Ou /

Publication date- 1976

Pagination- 57 Pages

Report/patent- ORO-4944-5

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Energy Research and Development Administration, Washington, D.C. (USA). Div. of Geothermal Energy
E-(40-1)-4944 /

Corporate Author- Oklahoma Univ.

School of Chemical Engineering and Materials Science
Norman , USA

Auxiliary expression(s)-

Illus. / Diagram (3) / Graph (6) /

Table

Ref.

Descriptor(s)- / Algorithms / Binary cycle power generation /
Computerized simulation / Cost / Efficiency / Exploitation /
Geothermal fluids / Heat exchangers / Mixtures / Optimization /
Research programs / Sensitivity analysis / Working fluids /

Abstract by Author

During the first half of Phase II of this research program, the following elements of research have been performed: (1) the upgrading of the conventional geothermal binary cycle simulation computer program, (2) development of a preliminary version of a direct contact heat exchanger algorithm, (3) comparison studies of mixture and pure fluid cycles, including relative equipment sizing and economics, (4) sensitivity analysis of brine cost, heat exchanger cost, operating conditions and working fluid composition on total geothermal power system cost, and (5) the development of a parameter optimization algorithm to aid cycle evaluation studies. The second half of the Phase II research program will be devoted to parameter sensitivity studies in order to quantify the advantages and disadvantages of mixture utilization. A preliminary analysis of cycle alternatives, such as staged flash binary systems and direct contact evaporator systems, will be conducted.

873. GGIS-100456/R/ / /M/ / / / /

Title- Resource Utilization Efficiency Improvement of Geothermal
Binary Cycles, Phase II

(June 15, 1976 - December 31, 1977)

Subtitle- Final Report

Author(s)- / Starling, Kenneth E. / West, Harry / Iqbal, Khan Zafar
/ Hsu, C.C. / Malik, Z.I. / Fish, L.W. / Lee, C.O. /

Publication date- 1978

Pagination- 117 Pages

Report/patent- ORO-4944-7

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA). Div. of
Geothermal Energy

EY-76-S-05-4944 /

Corporate Author- Oklahoma Univ.

School of Chemical Engineering and Materials Science

Norman, USA

Auxiliary expression(s)-

Illus. / Diagram (9) / Graph (31) /

Table

Ref.

Descriptor(s)- / Binary cycles / Comparative evaluations /
Computerized simulation / Cost / Efficiency / Exploitation /
Flashing / Geothermal resources / Heat exchangers / Optimization
/ Research programs / Thermodynamic properties / Working fluids
/

Abstract by Author

During Phase II of this research program, the following elements of research have been performed: (1) improvement in the conventional geothermal binary cycle simulation computer program, (2) development of a direct contact brine heat exchanger algorithm for the cycle simulation program, (3) development of a preheater algorithm for the cycle simulation program, (4) modification of the basic simulation program to incorporate the staged flash binary cycle, (5) development of a parameter optimization algorithm to aid cycle evaluation studies, (6) sensitivity analysis of cost factors, (7) comparison of pure hydrocarbon and binary mixture cycles.

874. GGIS-100393/O/ / /A/ / / /

Title- Results of Flow Tests of Edna Delcambre No. 1:

Subtitle- II. Summary of Gas Analysis

Author(s)- / Karkalits , O. Carroll / Hankins , B.E. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3, June 1980

Pagination- Page 1347, 25 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA) /

Corporate Author- McNeese State Univ.

Lake Charles , LA , USA

Auxiliary expression(s)-

Illus. / Diagram (3) / Graph (3) /

Table

Ref.

Descriptor(s)- / Chemical composition / Dissolved gases / Edna Delcambre No 1. Well / Experimental results / Fluid flow / Gas analysis / Geopressured wells / Geothermal brines / Louisiana / Natural gas / Sampling methods / Solubility / Testing /

Abstract by Author

One of the major objectives of the flow tests was to determine the amount of gas dissolved in the geopressured brine. The gas/water ratio was measured on bottom-hole samples, as well as on flowing streams from the gas/water separator. Problems connected with gas/water ratio from bottom-hole samples are discussed. Gas analyses are presented, along with a discussion of recombination and differential liberation study results. The latter studies were made to determine the solubility limit of the dissolved gas in the geopressured brine. At the reservoir temperature and pressure (about 240 DEG F and 11,000 psi), this value was found to be 44-88 SCF/bbl. The natural gas associated with the geopressured brine was of pipeline quality (after dehydration), and had a heating value (HHV) of about 1040 BTU/SCF. A companion paper by Dr. B. E. Hankins et al. presents data on the chemical analysis of the geopressured brine.

875. GGIS-100139/R/ / /M/ / / / /

Title- Results of Reservoir Evaluation Tests, 1976

Subtitle- East Mesa Geothermal Field, CA

Author(s)- / Narasimhan , T. N. / McEdwards , D. G. / Witherspoon , P. A. /

Publication date- July 1977

Pagination- 9 Pages

Report/patent- LBL-6369

Local Availability- CES

Sponsor- / ERDA

W-7405-ENG-48 /

Corporate Author- University of California, Berkeley

Lawrence Berkeley Laboratories

Berkeley , California , USA

Auxiliary expression(s)-

Illus. / Graph (5) / Map (2) /

Table

Ref.

Descriptor(s)- / Aquifer tests / East Mesa Geothermal Field / Geologic structures / Permeability / Reservoir properties / Transmissivity /

Abstract by Author

Two interference well tests, conducted at the U. S. Bureau of Reclamation's East Mesa Geothermal test facility in Southern California by the Lawrence Berkeley Laboratory, serve to better define the geothermal reservoir's geometry and hydrologic characteristics. Temperature profiles taken indicate that the reservoir is approximately 3000 feet thick and is located about 6000 feet below the ground surface. The temperature at depth is approximately 350 DEG C. The two well tests, each of approximately 10 days' duration yield respective reservoir transmissivities of 11,200 and 29,500 millidarcy-feet and compressibilities of 5.7×10^{-3} and 2.1×10^{-3} feet per PSI. The tests also indicate the possible presences of a sealed fault and a leaky fault in the reservoir.

876. GGIS-100510/R/ / /M/ / / / /

Title- Review of exp 222 RN in Natural Gas Produced from Unconventional Sources

Author(s)- / Gogolak , C. V. /

Publication date- November 1980

Pagination- 38 Pages

Report/patent- DOE/EML-385

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Department of Energy, Washington, D.C. (USA) /

Corporate Author- Department of Energy

Environmental Measurements Lab.

New York , USA

Geopressured Geothermal Bibliography

Descriptor(s)- / Aquifers / Coal deposits / Gas production /
Geopressured reservoirs / Natural gas / Radioactivity / Sand /
Shale / Trace amounts /

Abstract by NTIS

A review of the literature on trace radioactivity in natural gas and natural gas products has been performed and the consequent radioactivity concentrations and dose rates due to natural radioactive elements in natural gas produced from Devonian shale wells, western tight gas sands, geo-pressurized aquifers and coal beds have been studied. Preliminary data on aquifers and coal beds have been studied. Preliminary data on exp 222 Rn concentrations from these energy sources fall within the range observed for more conventional sources. Gas produced from reservoirs with higher than average natural exp 238 U contains higher than average levels of exp 222 Rn. Massive fracturing techniques do not appear to raise the relative concentration of radon in natural gas.

877. GGIS-100056/J/ / /A/ / / / /

Title- Review of Alternative Energy Technologies

Author(s)- / Walsh, Terry E. /

Publication date- Vol. 32, Issue 1, January 1980

Corporate Author- Bechtel National, Inc.

San Francisco, California, USA

Descriptor(s)- / Electric power / Geopressure resources / Hot dry rock systems / Hydrothermal systems / Magma systems / Power generation / Technology assessment /

Abstract by Compendex

The author addresses two important alternative energy resources, solar and geothermal, with emphasis on their potential application in electric power generation. The objective of this presentation is to provide a realistic view of the principal technology options that are being developed or that are available. The solar systems discussed employ various means of collection and conversion, excluding biological and hydroelectric. The resources for geothermal power applications include hydrothermal, geopressured, hot dry rock, and magma.

878. GGIS-100053/J/ / 2809/A/ / / / /

Title- Review of Geopressure Evaluation from Well Logs

Subtitle- Louisiana Gulf Coast

Author(s)- / Lane, R. A. / MacPherson, L. A. /

Journal- Journal of Petroleum Technology

Publication date- Vol. 78, Issue 9, September 1976

Pagination- Page 963, 8 Pages

Note- also NTIS #1 L. 1723

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Well logging / Electric oil well logging / Oil wells / Bottom hole pressure / Oil well drilling / Oil shale / Temperature gradients / Logging / Sand log / Resistivity log /

Pressure gradients / Louisiana / Geopressured systems / Tables /
Diagrams / Sonic logging / Statistical analysis /
Abstract by NTIS (revised)

Recent Gulf Coast drilling experience and log data reveal irregularities in resistivity trends. Anomalies caused by age boundaries, younger sediments, and other phenomena may make log relationships difficult to apply. The geographic distribution and interpretation techniques for some of these anomalies are presented. Resistivity-trend departure/pressure relationships are examined.

879. GGIS-100011/0/ / /A/ / / / /

Title- Review of Geothermal Resources

Author(s)- / Robson , Geoffrey /

Conference- Magnitude and Deployment Schedule of Energy Resources

Publication date- September 1975

Pagination- Page 77 , 8 Pages

Report/patent- CONF--750720-

Descriptor(s)- / Capital / Electric power / Exploitation / Financing /
Geopressure resources / Geothermal industry / Geothermal power
plants / Geothermal resources / Investment / Power generation /
Resource development /

Abstract by GGIS

Geothermal development is discussed in terms of the necessary financial requirements for exploitation, and the likelihood that capital will be forthcoming. The geothermal industry requires considerable front-end expenditures before it can be determined that an economically viable resource has been discovered. Because an element of risk is involved, the availability of capital for this will be determined by the profitability of this initial investment when compared with alternatives, rather than the cost of electricity produced from geothermal energy compared to the cost of electricity from other alternative sources. As long as lower investment costs and greater revenues persist for domestic offshore oil compared to geothermal steam production, it is unlikely that risk capital will shift to geothermal resource development. However, as domestic petroleum resources, both onshore and offshore, become depleted, and additional production requires greater investment risk, it is expected that more capital will flow into geothermal development, although not much before the year 2000.

880. GGIS-100436/R/ / /M/ / / / /

Title- Review of Geothermal Subsidence

Author(s)- / Phillips , S. L. / Fair , J. A. / Henderson , F. B., III
/ Schwartz , S. R. /

Publication date- September 1975

Pagination- 38 Pages

Report/patent- LBL-3220

Available- National Geothermal Information Resource
Lawrence Berkeley Laboratory
University of California

Geopressured Geothermal Bibliography

Berkeley

CA

94720

(Paper copy)

Local Availability- CES

Sponsor- / Energy Research and Development Administration,
Washington, D.C. (USA). Office of Public Affairs /

Corporate Author- California Univ.

Lawrence Berkeley Lab.

Berkeley, USA

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Artificial recharge / Communities / Compaction /
Control / Earth movements / Environmental effects / Fluid
withdrawal / Geothermal systems / Ground subsidence / Overdraft
/

Abstract by GGIS

This bibliography contains articles dealing with the effects of subsidence, with regard both to damage to field pipelines and power plants and to effects on communities. The literature included is limited primarily to subsidence due to withdrawal of geothermal fluids; however, some documents relating to subsidence effects due to oil and gas exploitation, and to groundwater pumping for petroleum, agricultural, and drinking purposes are included. The period covered is mainly from 1970 to August, 1975. ReInjection is a possible means of controlling subsidence; however, factors to be considered in relation to reinjection include distance between reinjection wells and producing wells, cost, and decrease of efficiency of pipes due to scaling. Areas needing further research include: development of a model for predicting geothermal subsidence; laboratory testing of rock samples obtained at depth to measure rock compaction, and development of rock-sampling techniques at depth; improved instrumentation for monitoring horizontal and vertical subsidence; data on natural land subsidence that is not related to man-caused geothermal fluid withdrawal; analyses of economic effects; means of identifying those parts of known geothermal areas most likely to undergo land subsidence; and evaluation of the effects of fluid injection.

881. GGIS-100002/0/ / 2/A/ / / / /

Title- Review of Techniques in the Detection and Drilling of
Overpressured Formations

Author(s)- / Fertl, Walter H. / Timko, Donald J. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 2, 1970

Pagination- Page 131, 5 Pages

Auxiliary expression(s)-

Illus. / Sketch map (1) /

Descriptor(s)- / Gulf Coast / Engineering geology / Geopressured
reservoirs / Clastic rocks / Terrigenous / Geopressure /

Drilling / Techniques / Engineering properties / Pore water /
Diagenesis /

882. GGIS-100267/B/ / /A/ / / / /

Title- Risk and Return on Investment for Geothermal Development

Subtitle- January 1977.

Author(s)- / Larson , Tod /

Publisher- Geothermal World Publications
Reseda, California

Publication date- 1977

Pagination- Page 304 , 10 Pages

Report/patent- PB-297 889

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / National Science Foundation
AER7508793 /

Corporate Author- California Univ., Riverside
Dry-Lands Research Institute
Riverside , California , USA

Auxiliary expression(s)-

Illus. / Graph (4) /

Table

Descriptor(s)- / California / Cost / Energy source development /
Geothermal exploration / Imperial County / Investment / Power
range 100-1000 MW / Profits / Public utilities / Risk assessment
/

Abstract by TIC

Optimistic and pessimistic assumptions for development of a
200-MW field in Imperial County, California are summarized. The
differing views of risk from the standpoint of the field
developer and the public utility are discussed. Development
costs are compared with coal and nuclear energy production.

883. GGIS-100053/J/ / 2112/A/ / / / /

**Title- Rock Compressibility and Failure as Mechanisms in
Geopressured Gas Reservoirs**

Author(s)- / Harville , D. W. / Hawkins , M. F., JR. /

Journal- Journal of Petroleum Technology

Publication date- Vol. 21 , Issue 12 , December 1969

Pagination- Page 1528 , 3 Pages

Descriptor(s)- / Petroleum reservoir engineering / Natural gas wells
/ Rock mechanics / Geopressure /

Abstract by NTIS

Rock compressibility has been recognized as an important
factor in material-balance calculations of oil in place for
closed reservoirs producing above bubble- point pressure.
Because gas compressibilities decrease with increasing
pressures, the consideration of rock compressibility becomes
increasingly important for deeper, high pressure gas
reservoirs. It is proposed that because of low net overburden
pressures, rock compressibilities in geopressured reservoirs are

Geopressured Geothermal Bibliography

much greater than for similar rocks in normally pressured reservoirs.

884. GGIS-100002/O/ / 1/A/ // //

Title- Rock Compressibility and Failure as Reservoir Mechanisms in Good Reservoirs

Author(s)- / Harville , D. W. / Hawkins , M. F. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 1 , Issue 1 , 1967

Pagination- Page 81 , 10 Pages

Descriptor(s)- / Engineering geology / Rock mechanics / Compression / Failure / Reservoir rocks / Natural gas / Mechanism / Geopressure / Production / Relation /

885. GGIS-100048/J/ / 1505/A/ // //

Title- Role of Anomalously High Formation Pressures (AHFP) in Development of Traps for and Accumulations of Oil and Gas in Southern Caspian Basin

Author(s)- / Dermish'yan , A. G. /

Journal- Int. Geol. Rev.

Publication date- Vol. 15 , Issue 5 , 1973

Pagination- Page 508 , 9 Pages

Auxiliary expression(s)-
Illus.

886. GGIS-100241/O/ / /A/ // //

Title- Role of Municipalities in Geothermal Resource Development

Author(s)- / Kramer , W. K. / Hammer , M. /

Conference- Geothermal Resources Development Institute Conference

Salt Lake City

Utah

USA (January 27 , 1977)

Publisher- Rocky Mountain Mineral Law Foundation

Boulder, CO

Publication date- January 27 , 1977

Pagination- 29 Pages

Report/patent- CONF-770135--

Descriptor(s)- / California / Contracts / Energy source development / Exploitation / Geothermal exploration / Geothermal resources / Laws / Legal aspects / Public utilities / Urban areas /

Abstract by TIC

Those provisions of California law affecting municipal utilities interest in geothermal exploration, development, and exploitation are explored. The various problems encountered by the City of Burbank and the Northern California Power Agency are used as illustrations. The impact of self-imposed limitations

in the form of outstanding bond covenants and other contractual obligations are considered. (MHR)

887. GGIS-100275/I/ / /M/ / / / /

Title- Rules Having Statewide General Application to Oil, Gas and Geothermal Resource Operations Within the State of Texas

Publication date- November 1975

Pagination- 210 Pages

Available- Railroad Commission of Texas

1124 S. IH 35

Austin

TX

(Paper copy)

Local Availability- CES

Corporate Author- Texas Railroad Commission

Austin, TX, USA

Descriptor(s)- / Gas production / Geopressure resources / Geothermal exploration / Geothermal resources / Oil production / Production / Regulations / Regulatory guides / Resource development / Texas / Texas Railroad Commission /

Abstract by GGIS

Rules and regulations adopted by the Texas Railroad Commission governing the exploration, development, and production of geothermal, oil, and gas resources are presented. A glossary of terms used in the report is included.

888. GGIS-100528/O/ / /A/ / / / /

Title- Salinity of Deep Formation Waters, Texas Gulf Coast

Subtitle- Preliminary Results

Author(s)- / Morton, R.A. / Posey, J.S. / Garrett, C.M. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 185, 3 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy
DE-AC08-79ET27111

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy
DE-AC08-79ET27111 /

Auxiliary expression(s)-

Illus. / Figure (1) / Graph (1) /
Ref.

Descriptor(s)- / Aquifers / Frio Formation / Geopressured reservoirs / Gulf Coast / Interstitial water / Methane / Salinity / Texas /

Abstract by Author (rev.)

A study that was initiated to evaluate the local and regional structural and stratigraphic controls on formation water in the Frio Formation in Texas is described. The methane entrained in geopressured aquifers is a vast but dilute resource that remains

largely untested because many uncertainties are associated with exploration and commercialization. Knowing the subsurface distribution of saline waters is important because methane solubility is partially controlled by salinity, the degree of corrosion and scaling of surface equipment depends on concentrations and chemical composition of produced waters, the compatibility with shallower waters may control the long-term disposal of spent geothermal fluids, and the calibration of log-derived salinities depends on actual field conditions.

889. GGIS-100528/O/ / /A/ / / / /

Title- Salinity Determination from Logs and Controls on Methane Content

Subtitle- Introductory Remarks

Author(s)- / Dorfman , Myron H. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 183 , 1 Pages

Local Availability- GGIS

Local Availability- CES

Descriptor(s)- / Geochemistry / Interstitial water / Methane / Research programs / Salinity / Solubility / Well logging / Wells of opportunity /

Abstract by GGIS

An introduction to the papers in the 5th Geopressured Geothermal Energy Conference concerned with salinity determination from logs and controls on methane content is provided.

890. GGIS-100056/J/ / 26/A/ / / / /

Title- Salt Domes as a Source of Geothermal Energy

Author(s)- / Jacoby , C. H. / Paul , D. R. /

Journal- Min. Eng. (New York)

Publication date- Vol. 26 , 1974

Pagination- Page 34 , 6 Pages

Descriptor(s)- / Lithology / Rocks / Heat flow / Temperature gradients / Temperature measurement / Salt deposits / Theoretical treatments / Drilling / United States / Louisiana / Mississippi / Texas / Alabama /

891. GGIS-100995/ / / /A/ / / / /

Title- Sampling in Geothermal Operations

Subtitle- Philosophy and Reality

Author(s)- / Vetter , O. / Woodruff , E. / Watson , J. / Shannon , D. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 693 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98
Davis
California
95616

Local Availability- CES

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Geothermal fluids / Sampling methods /
Standardization /

Abstract by Author

The sampling and analysis (chemical or other) geothermal fluids, i.e., liquids, gases and suspended particles, is being done today by different investigators using methods of their own choice. In the majority of the cases, the analytical numbers reported are not truly representative of the geothermal systems. Sampling problems are compounded by two-phase flows (or even flows with more than two phases present), and chemical reaction and precipitation processes occurring during sampling. The problem of sampling and analyzing geothermal fluids is further compounded by the fact that many wells produce fluids which can change their composition at various times as a function of changing reservoir and operational conditions. Battelle Pacific Northwest Laboratories is undertaking a new and comprehensive study of sampling and analytical methods used in geothermal operations. This study does not involve sampling for suspended or deposited solids. This paper describes the reasoning behind Battelle's efforts. The final goal of this study is to evaluate the possibility of standardizing the sampling methods in geothermal operations.

892. GGIS-100533/0/ / /A/ / / / /

Title- Sampling Geopressured Fluids

Subtitle- Some Contributions from the Properties of the H₂O-CH₄ System

Author(s)- / Iglesias, Eduardo R. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16, 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 84, 14 Pages

Local Availability- GGIS

Corporate Author- California Univ.

Lawrence Berkeley Lab., Earth Sciences Division
Berkeley, USA

Auxiliary expression(s)-

Illus. / Graph (7) /

Ref.

Table

Descriptor(s)- / Analysis / Brines / Composition / Differential pressure / Downhole sampling / Fluid properties / Formation testing / Geopressured wells / Geopressured zones / Gulf Coast / Mathematical models / Measuring methods / Methane / Pressure gradients / Pressure measurements / Recovery processes /

Geopressured Geothermal Bibliography

Sampling methods / Testing / Well characteristics / Well information systems /

Abstract by GGIS

A simple model (an "equation of state") of the H₂O-CH₄ system, developed to predict the thermophysical properties of geopressured fluids, is briefly described. The "equation of state" is applied to calculate and discuss fluid properties relative to different stages of the sampling process of unexploited geopressured reservoirs of the U.S. Gulf Coast.

893. GGIS-100487/G/ / /C/ / / / /

Title- Sand Thickness Between the Surface of 0.7-PSI/Ft. Fluid-Pressure Gradient & -15,000 Ft. Showing Relation Geothermal Surfaces

Subtitle- Rio Grande Embayment, Texas

Conference- Third Geopressured-Geothermal Energy Conference Lafayette

LA (November 16 , 1977)

Note- Hydrogeology by R.H. Wallace, Jr.

Local Availability- GGIS

Corporate Author- Department of the Interior United States Geological Survey

Descriptor(s)- / Cameron County / Contour maps / Fluid pressure / Formation thickness / Geopressured zones / Hidalgo County / Kenedy County / Maps / Rio Grande Embayment / Sand / Temperature distribution / Temperature measurement / Texas / Willacy County /

Abstract by GGIS

The sand thickness between the surface of the .7psi/ft. fluid-pressure gradient and -15,000ft. showing relation to the 248 deg F and 302 deg F geothermal surfaces in the Lower Rio Grande Embayment (Texas) is shown on this map. Color coded shading shows the sand thickness, and contour lines show equal sand thickness. Areas are marked where: the 248 deg F geothermal surface occurs above .7psi/ft.; and where the 302 deg F geothermal surface occurs below -15,000 ft. altitude. Faults are indicated for structural reference. The scale of the map is 1:192,000.

894. GGIS-100326/R/ / /M/ / / / /

Title- Sandstone Consolidation Analysis to Delineate Areas of High-Quality Reservoirs Suitable for Production of Geopressured Geothermal Energy along the Texas Gulf Coast

Author(s)- / Loucks , R.G. / Dodge , M.M. / Galloway , W.E. /

Publication date- January 1979

Pagination- 103 Pages

Report/patent- ORO-5541-1

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

EG-77-S-05-5554 /
 Corporate Author- Texas Univ., Austin
 Bureau of Economic Geology
 Austin, Texas, USA
 Auxiliary expression(s)-
 Illus. / Figure (23) / Map (15) / Graph (40) / Photo (3) /
 Ref.
 Descriptor(s)- / Consolidation / Frio formation / Geopressured reservoirs / Geopressured zones / Gulf Coast / Mineral composition / Permeability / Porosity / Reservoir pressure / Reservoir properties / Reservoir temperature / Sandstone / Sonic logging / Texas / Vicksburg formation / Wilcox formation /
 Abstract by Author (rev.)
 Analysis of reservoir quality of lower Tertiary sandstones along the Texas Gulf Coast delineates areas most favorable for geopressured geothermal exploration. Reservoir quality is determined by whole core, acoustic log, and petrographic analyses. Wilcox sandstones exhibit no regional reservoir quality trends. In Lower and parts of Middle and Upper Texas Gulf Coast the sandstones are relatively well consolidated, but in other parts of Middle and Upper Texas Gulf Coast they show a reversal toward increased porosity at depth. Vicksburg sandstones have the poorest reservoir quality of sandstones of any formation prospective for geothermal energy. Frio sandstones show a systematic increase in reservoir quality from Lower to Upper Texas Gulf Coast. This increase in reservoir quality correlates to changes in rock composition and cementation. Acoustic log analysis substantiates a progression of greater consolidation from Upper to Lower Texas Gulf Coast. The Wilcox Group has good reservoir potential for geopressured geothermal energy in the Middle Texas Gulf Coast and possibly in adjacent areas, but other Wilcox areas are marginal. The Vicksburg Formation in the Lower Texas Gulf Coast is not prospective. The Frio Formation in the Upper Texas Gulf Coast has the best deep-reservoir quality of any unit along the Texas Gulf Coast.

 895. GGIS-100053/J/ / /A/ / / / /

Title- Scaling and Corrosion in an Experimental Geothermal Power Plant

((jpt forum))

Author(s)- / Bishop, Harry K. / Bricarello, John R. /

Journal- Journal of Petroleum Technology

Publication date- September 1978

Pagination- Page 1240, 3 Pages

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (1) / Table (1) /

Ref.

Descriptor(s)- / Brines / California / Corrosion / Geothermal brines / Geothermal fluids / Power plants / Salton Sea / Scaling /

Abstract by FC

A case study of the Geothermal Loop Experimental Facility in California which uses geothermal fluids from the Salton Sea is

Geopressured Geothermal Bibliography

presented. The topic of concern is scaling and corrosion. The brine chemistry, the scale composition, and the corrosion incidence have been studied. Recommendations for removing scale deposits and for preventing scaling and corrosion are made.

896. GGIS-100224/B/ / /A/ / / / /

Title- Selected Geopressured Geothermal Energy Bibliography

(In Geology of Alternate Energy Resources in the South-Central United States)

Publisher- Houston Geological Society
Houston, Texas

Publication date- 1977

Pagination- Page 337 , 6 Pages

Available- Geothermal Information Services

318 Cherrywood St.

West Covina

CA

91791)

Descriptor(s)- / Bibliographies / Energy source development /
Environmental effects / Geopressure / Geopressure exploration /
Geopressured systems / Uses /

Abstract by TIC

A bibliography covering geopressured geothermal energy exploration, development and utilization, and environmental considerations is presented. (LBS)

897. GGIS-100489/R/ / /M/ / / / /

Title- Semi-Annual Report for the Unconventional Gas Recovery Program

Subtitle- Period Ending September 30, 1980

Author(s)- / Manilla , R.D. /

Publisher- Department of Energy, Morgantown Energy Technology Center
Morgantown, WV

Publication date- November 1980

Pagination- 353 Pages

Report/patent- DOE/METC/SP-80/22

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Corporate Author- Department of Energy
Morgantown Energy Technology Center
Morgantown , WV , USA

Auxiliary expression(s)-

Illus. / Diagram (5) / Figure (8) / Graph (57) / Map (51) /

Table

Descriptor(s)- / Aquifers / Dissolved gases / Environmental effects /
Exploitation / Field studies / Geothermal fluids / Gulf Coast /
Industry / Information systems / Institutional aspects / Legal
aspects / Methane / Natural gas deposits / Natural gas industry /

Regional analysis / Research programs / Resource assessment /
 Sand / Shale / Site selection / Technology /
 Abstract by GGIS

There are four project elements in the Unconventional Gas Recovery Program: evaluation, resource and site characterization; research, instrumentation, and model development; and production technology development. The program achievements at the half year are described in this report. Some of the outstanding achievements include: the publication of "Evaluation of Data Gathered From Unminable Coal Seams"; the development of specifications for a data base containing coalbed methane well test data; and an increase in cooperative drilling with MRCP, such that nine wells were tested and eleven more are scheduled to be tested. Additional accomplishments include: plans that Sandia Laboratories and the University of Missouri at Rolla have prepared for the field testing of a system subassembly of the water jet drilling system; a contract award to develop and evaluate near mine stimulation techniques for coalbed gasification; and a contract award to validate the "chip desorption" procedure and to study the effects of pore structure on methane drainage. Production technology development activities have included: the transfer of the the Westinghouse project to demonstrate the technical feasibility of onsite power generation using a methane-fueled turbine generator to the Bethlehem Steel Marianna Mine No. 58 site, which is connected to a shaft venting methane from horizontal boreholes; and improvement in the horizontal drilling techniques between the first trial borehole and the most recent production hole at the Occidental Research Corporation/Island Creek coal mine project sites.

898. GGIS-100494/R/ / /M/ / / / /

Title- Semi-Annual Report for the Unconventional Gas Recovery Program

Subtitle- Period Ending March 31, 1980

Author(s)- / Manilla, R. D. /

Publication date- June 1980

Pagination- 501 Pages

Report/patent- DOE/METC/SP-80-12

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Department of Energy, Washington, D.C. (USA) /

Corporate Author- Department of Energy

Morgantown Energy Technology Center

Morgantown, WV, USA

Descriptor(s)- / Aquifers / Coal deposits / Enhanced recovery /

Geopressured reservoirs / Geopressured systems / Methane /

Natural gas / Research programs / Sand / Shale / USA /

Abstract by NTIS

Four subprograms are reported on: methane recovery from coalbeds, Eastern gas shales, Western gas sands, and methane from geopressured aquifers.

899. GGIS-100311/R/ / /M/ / / / /

Title- Semi-Annual Report on the Project to Design and Experimentally Test an Improved Geothermal Drill Bit

Author(s)- / Barker , L.M. / Green , S.J. / Maurer , W.C. /

Publication date- January 1976

Pagination- 74 Pages

Report/patent- TID--28704

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Energy Research and Development Administration

E(10-1)1546 /

Corporate Author- Terra Tek, Inc.

Terra Tek, Inc. , Salt Lake City , Utah , USA

Auxiliary expression(s)-

Illus. / Diagram (7) / Graph (13) / Map (4) / Photo (1) /

Table

Ref.

Descriptor(s)- / Design / Drill bits / Elastomers / Geothermal drilling / High temperature / Laboratory testing / Seals / Steels /

Abstract by Author

Work was started on the effort to design and test an improved geothermal drill bit on May 19, 1975. Terra Tek, Inc., is the prime contractor, with Maurer Engineering as a subcontractor and Reed Tool Company providing informal industry participation. The major tasks of the Phase I effort are (1) failure mechanisms of existing bits, (2) new steels and new bearing design, and (3) new seals and lubricants. Considerable progress has been made in understanding the causes of premature drill-bit failure in the geothermal well drilling environment. As a result, there appears to be a high probability that very significant gains in drill-bit life can be achieved by optimizing the drill-bit materials and the design for operation at higher temperatures. Drill-bits of high-temperature steels are being fabricated, as well as a test chamber to simulate the geothermal environment. In addition, several basic properties of the candidate steels and of the conventional drill-bit steels have been gathered from the literature, and provisions have been made for completing the material property picture through a materials testing program at Terra Tek. Considerable background material has been gathered on the drill-bit seal problem and on candidate seal materials. Some seal materials have been selected for further testing, and seal tester is being designed to provide a very good simulation of the environment experienced by seals in geothermal well drill-bits.

900. GGIS-100313/R/ / /M/ / / / /

Title- Semi-Annual Report on the Project to Design and Experimentally Test an Improved Geothermal Drill Bit, Phase II

Author(s)- / Barker , L.M. / Green , S.J. /

Publication date- December 1976

Pagination- 49 Pages

Report/patent- TID--28685

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U.S. Energy Research and Development Administration

E(10-1)1546 /

Corporate Author- Terra Tek, Inc.

Salt Lake City , Utah , USA

Auxiliary expression(s)-

Illus. / Diagram (6) / Graph (3) / Photo (5) /

Table

Ref.

Descriptor(s)- / Design / Drill bits / Elastomers / Geothermal drilling / High temperature / Laboratory testing / Lubricants / Seals / Steels /

Abstract by Author

Work began on an effort to design and test an improved geothermal drill bit on May 19, 1975. Phase I of the contract, which lasted for one year, was devoted largely to (1) the study of the geothermal environment and the failure mechanisms of existing geothermal drill bits, (2) the design and construction of test facilities for testing both drill bit seals and full-scale drill bits under simulated geothermal drilling conditions, and (3) the procurement of research drill bits of high-temperature steels for the initial testing in the geothermal drill-bit test facility. The present semi-annual report describes the progress made during the first half of Phase II of the program, covering the period from May 19 to November 19, 1976. During the period of this report, the test facilities (the geothermal drilling vessel and the geothermal drill-bit seal tester) were completed and "de-bugged", and the first tests were run on full-scale research drill bits and drill-bit seals. In addition, more materials information was gathered, and a number of additional seals of high-temperature elastomer materials were obtained for testing. Maurer Engineering, on a subcontract basis, has also been active in the design and procurement of candidate high-temperature drill-bit seals for testing, and has done a literature and patent search on the problem of drill-bit insert retention. Reed Tool Co. has cooperated in the fabrication of drill bits for testing, and has offered consultation on certain seal designs.

901. GGIS-100393/O/ / /A/ / / / /

Title- Sensitivity of the Economics of a Geopressured Energy Prospect to Variation in Geologic Parameters

Author(s)- / Ray , Thomas G. / Johnson , Adrain E., Jr. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3, June 1980

Pagination- Page 1499 , 11 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Geopressed Geothermal Bibliography

Austin
TX
USA
(Paper copy)
Local Availability- CES
Corporate Author- Louisiana State Univ.
Baton Rouge , USA
Auxiliary expression(s)-
Illus. / Graph (3) /
Table
Ref.
Descriptor(s)- / Aquifers / Compressibility / Computerized simulation
/ Economic impact / Economics / Geopressed reservoirs /
Geothermal brines / Louisiana / Methane / Models / Permeability /
Porosity / Reservoir pressure / Reservoir properties / Reservoir
temperature / Resource development / Volume /
Abstract by Author
This paper analyzes the effects of changes in geologic
parameters upon economic indicators, such as net present value
(NPV), for a specific geopressed prospect site, using the
techno-economic simulation model described in a separate
presentation at this conference. Results are presented showing
the variations in the economic indicators with geologic
parameters such as reservoir size, effective compressibility,
porosity, permeability, etc. Those parameters which were found
to be most important (that is, have major effects when varied to
the extent of their uncertainty range) are identified. These
results are subject to the assumption that an aquifer brine is
saturated with methane at the temperature, pressure, and
salinity predicted for it. The saturated methane amount was
calculated quite accurately within the ranges of the variables
encountered in Louisiana aquifers by a correlation of the
available literature data.

902. GGIS-100058/J/ / 7346/A/ // //

Title- Shale Data Key to Drilling Problems

(Illustrations of Australian, Persian Gulf, Indonesian Well
Logs to Explain North Sea Drilling Problems)

Subtitle- 1. of 2 pt, Interpreting Pressure Profiles

Author(s)- / Gill , J. A. / Gregg , D. N /

Journal- Oil and Gas Journal

Publication date- Vol. 73 , Issue 46 , November 17 , 1975

Pagination- Page 64 , 5 Pages

Auxiliary expression(s)-

Illus. / Figure (8) /

903. GGIS-100002/O/ / 3/A/ // //

Title- Shale Mineralogy and Overpressure

Subtitle- Some Case Histories of Pressure Detection Worldwide
Utilizing Consistent Shale Mineralogy Parameters

Author(s)- / Gill , J. A. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge
Louisiana
USA

Publication date- Vol. 3, 1972

Pagination- Page 121, 3 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Sedimentary rocks / Clastic rocks / Terrigenous /
Shale / Mineral composition / Relation / Pressure buildup /
Geopressure / Diagenesis / Pore water / Mechanism / United States
/ Anadarko Basin / Africa / West / Coastal / Australia / Western
Australia / Arabian Gulf /

904. GGIS-100393/O/ / /A/ / / / /

**Title- Shale Mineralogy of the No. 1 Pleasant Bayou Geothermal Test
Well: A Progress Report**

Author(s)- / Freed, Robert L. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 1, June 1980

Pagination- Page 153, 15 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

78712

(Paper copy)

Local Availability- CES

Sponsor- / Trinity Univ., San Antonio, TX (USA)

Sponsor- / Department of Energy, Washington, DC (USA) /

Auxiliary expression(s)-

Illus. / Graph (2) /

Table

Ref.

Descriptor(s)- / Brazoria County / Chemical analysis methods / Clay
mineralogy / Geopressured zones / Mineral composition /
Mineralogy / Pleasant Bayou No. 1 Well / Shale /

Abstract by Author

Thirty-three shale samples, ranging in depth from 2,185 to 15,592 ft, were examined by x-ray diffraction methods to determine changes in mineralogy with depth. Quartz is present in all samples and averages 15 weight percent (wt%). Above 7,800 ft, calcit content ranges from 0-9 wt%. Total clay content, combining kaolinite, illite, mixed-layer illite-montmorillonite (I/M), and traces of chlorite, is essentially constant, averaging 65 wt%. Individual clay minerals have quite variable contents from sample to sample, but distinct trends are noted: (1) kaolinite content is constant at an average of 25% total clay; (2) illite content initially averages 35% total clay, decreases with depth, and is zero in 10 of the 14 samples below 10,000 ft; and (3) mixed-layer I/M averages 40% total clay in shallow samples and 70% in deeper samples. The top of the geopressured zone, occurring at a fluid pressure gradient of 0.465 psi/ft and equilibrium temperature of about 190 DEG F, is marked by a definite increase of illite in mixed-layer I/M at

Geopressured Geothermal Bibliography

approximately 8,500 ft. A major change in montmorillonite content from 60% at 11,210 ft, to 16% at 11,750 ft, corresponds to a pressure gradient of 0.7 psi/ft, and equilibrium temperature of 250 DEG F. In addition, the arrangement of the I/M layers changes from random interstratification in samples from 11,540 ft, and shallower, to an ordered layering from 11,750 feet and deeper.

905. GGIS-100407/O/ / /A/ / / / /

Title- Shale Recharge and Production Behavior of Geopressured Resources

Author(s)- / Garg , S.K. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 325 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Sponsor- / Department of Energy, Las Vegas, NV (USA). Nevada

Operations Office /

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (3) /

Table

Ref.

Descriptor(s)- / Calculation methods / Clastic rocks / Compressibility / Computerized simulation / Facies / Geopressure / Geopressured reservoirs / Geothermal reservoirs / Ground water recharge / Gulf Coast / Permeability / Physical properties / Rock properties / Sand shale ratio / Sandstone / Sedimentary rocks / Shale / Simulation / Subsurface reservoirs /

Abstract by GGIS

Geopressures in the Gulf basin are frequently associated with massive shale facies and with alternating shale and sandstone facies. Although fluid resources cannot be recovered directly from the shales because of their low permeability, the shales may recharge the sandstones by yielding significant amounts of water to the permeable sandstones. This study was undertaken to determine conditions under which significant recharge will occur. MUSHRM, a reservoir simulator, was used to examine the effects of shale compressibility and vertical permeability on shale recharge. Results include calculations that show shale recharge to be a function of vertical shaft permeability, but not greatly influenced by shale compressibility.

906. GGIS-100528/O/ / /A/ / / / /

Title- Shallow Geopressured Aquifers in Texas and Their Potential for Production of Solution Gas

Author(s)- / Weise , B.R. / Morton , R.A. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 249 , 5 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Gas Research Inst., Chicago, IL (USA)
5011-321-0125 /

Auxiliary expression(s)-

Illus. / Figure (1) / Map (1) /

Table

Ref.

Descriptor(s)- / Aquifers / Dissolved gas / Geopressured zones / Gulf Coast / Matagorda County / Resource potential / Texas /

Abstract by Author

Shallow geopressured aquifers with fluid temperatures less than 300 deg F were examined to select areas prospective for producing solution gas. A total of 13 areas exhibited enough potential to warrant detailed studies, but after evaluation, only the Blessing area in Matagorda County was designated a prospect, and only a few other areas were judged worthy of consideration if additional data were favorable. In the Texas Gulf Coast, large-scale production of solution gas apart from production with other energy resources is unlikely in the near term because of low permeabilities and low gas-to-water ratios.

907. GGIS-100233/B/ / /A/ / / / /

Title- Simulation of Drive Mechanisms in Geopressured Reservoirs
(In Energy Resources and Excavation Technology)

Author(s)- / Garg , S. K. / Pritchett , J. W. /

Conference- 18. Symposium on Rock Mechanics; Rock Mechanics in Geothermal Development

Colorado

USA

Keystone (June 22 , 1977)

Publisher- Colorado School of Mines
Golden, CO

Publication date- 1977

Pagination- 4 Pages

Note- see CONF-770628--P1

Descriptor(s)- / Geothermal energy / Simulation / Artificial recharge / Compaction / Compressibility / Computer calculations / Computer codes / Geopressured reservoirs / Heat flow / Methane / Performance / Permeability / Reservoir rocks / Water influx /

Abstract by TIC

A fully three dimensional multiphase (liquid water with dissolved methane reversible methane gas) computer program has been developed for solving the system of equations which govern

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mass and heat flow in a geopressured geothermal reservoir. The computer model includes the effects of the four major reservoir drive mechanisms (water compressibility, reservoir rock compaction, evolution of methane gas, and influx of water from shale dehydration). A preliminary series of calculations was made in which the input data for the computer program were varied to assess the sensitivity of the reservoir performance to (1) the presence of gaseous methane in the pores, (2) relative permeability, (3) sediment compaction, and (4) reinjection of the waste fluids. The principal effect of the free gas, sediment compaction and reinjection is to increase the producing life of the reservoir. Effects of relative permeability depend upon the amount of gas saturation in the pore fluid.

908. GGIS-100528/O/ / /A/ / / / /

Title- Site Geology of the DOE Gladys McCall No. 1 Well

Author(s)- / Pyron, Arthur J. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 229, 3 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-80ET2717 /

Auxiliary expression(s)-

Illus. / Diagram (3) /

Descriptor(s)- / Cameron Parish / Data / Drilling / Electrical logging / Geology / Gladys McCall Well / Louisiana / Research programs / Seismic surveys / US DOE /

Abstract by Author

The geology of the Gladys McCall site is herein discussed. The Gladys McCall well was the first of four awarded to Technadril - Fenix & Scisson (T-F&S) as part of the DOE Design Well Program. Emphasis is made in the report on the geologic conditions encountered in drilling and the site specific geology as determined by electric log correlations, paleo data, and seismic interpretation.

909. GGIS-100896/R/ / /M/ / / / /

Title- Site Specific Analysis of Geothermal Development

Subtitle- Volume I. Summary Report

Author(s)- / Jacobsen, W. / Trehan, R. / Leigh, J. / Cohen, A. /

Publication date- Vol. 1, August 1978

Pagination- Page 63

Report/patent- HCP/T4014-01/1

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U.S. Department of Energy

EG-77-C-01-4014 /

Corporate Author- Mitre Corp.

McLean , Virginia , USA

Descriptor(s)- / Geopressured systems / Hydrothermal systems /
Forecasting / Planning / USA / Energy source development /

Abstract by TIC

MITRE/Metrek has analyzed development scenarios for 37 hydrothermal and geopressured prospects in the United States to assist DOE's Division of Geothermal Energy in mission-oriented planning of geothermal resource development. A summary of the site-specific analyses is presented with particular emphasis on possible recommendations for the Federal Geothermal Program.

910. GGIS-100896/R/ / /M/ / / / /

Title- Site Specific Analysis of Geothermal Development--Data Files of Prospective Sites

Subtitle- Volume III.

Author(s)- / Williams , F. / Cohen , A. / Pfundstein , R. / Pond , S. /

Publication date- February 3 , 1978

Pagination- Page 554

Report/patent- HCP/T4014-01/3

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U.S. Department of Energy

EG-77-C-01-4014 /

Corporate Author- Mitre Corp.

METREK Div.

McLean , Virginia , USA

Descriptor(s)- / Geopressured systems / Geothermal resources /
Hydrothermal systems / Energy source development / Arizona /
California / Data compilation / East Mesa KGRA / Geochemical
surveys / Geological surveys / Geophysical surveys / Geysers
Geothermal Field / Hawaii / Idaho / Legal aspects / Louisiana /
Maps / Montana / Nevada / New Mexico / Oregon / Ownership /
Populations / Resource assessment / Site selection / Tables /
Texas / Utah / Washington /

Abstract by TIC

Development scenarios for 37 hydrothermal and geopressured prospects in the United States were analyzed. This third of three volumes presents site-specific data and sample development schedules for the first plant on line at each of the 37 prospects.

911. GGIS-100243/R/ / /M/ / / / /

Title- Site Specific Analysis of Geothermal Development-Data Files of Prospective Sites

Subtitle- Volume II

Author(s)- / Trehan , R. / Cohen , A. / Gupta , J. / Jacobsen , W. /
Leigh , J. / True , S. /

Publication date- Vol. 2 , August 1978

Pagination- 488 Pages

Geopressured Geothermal Bibliography

Report/patent- HCP/T4014--01/2
Corporate Author- Department of Energy
Div. of Geothermal Energy
Washington , D.C. , USA
Descriptor(s)- / Energy source development / Economics / Geopressure
resources / Geopressured zones / Development / Planning / Site
selection / Technology utilization /
Abstract by TIC
Development scenarios for 37 hydrothermal and geopressured
prospects in the United States were analyzed to assist DOE's
division of geothermal energy in mission-oriented planning of
geothermal resource development. This second volume of the
three-volume series contains the detailed site-specific
analyses in terms of technological, economic, and other
requirements for meeting the postulated schedules. This
presentation should be used in conjunction with volume III,
which contains detailed descriptive data files for each of the
37 prospects. These data files were used for the analyses
contained in volume II and should be useful for other geothermal
resource studies.

912. GGIS-100895/ / / /A/ / / / /

Title- Solubility of Methane in Water at Elevated Temperatures and Pressures

Author(s)- / Bonham , L.C. /
Conference- AAPG--Sepm Annual Convention
Publication date- Vol. 62 , Issue 12 , December 1978
Pagination- Page 2478 , 4 Pages
Auxiliary expression(s)-
Illus. / Graph (2) /
Ref.

Descriptor(s)- / Depth / Elevated temperature / Fluid pressure /
Geopressure gradients / Geopressured zones / Geothermal
gradients / Low temperature / Moderate temperature / Salinity /
Solubility / Methane /

Abstract by Author

Published data on the solubility of methane in water covering the
range from 70 to 680 DEG F (21 to 360 DEG C) and from 600 to
16,000 psi (4,137 to 110,320 kPa) can be used to construct
depth-versus-solubility curves for given geothermal and
geopressure gradients.

913. GGIS-100543/R/ / /M/ / / / /

Title- Solubility of Methane in Water Under Natural Conditions
(Final Report for the Period April 1, 1978 to June 30, 1982)

Subtitle- A Laboratory Study
Author(s)- / Blount , Charles W. / Price , Leigh C. /
Publication date- 1982
Pagination- 153 Pages
Report/patent- DOE/ET/12145-1
Available- NTIS
(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Las Vegas, NV (USA). Nevada
Operations Office

DE-AS08-78ET12145 /

Auxiliary expression(s)-

Illus. / Figure (14) /

Table

Ref.

Descriptor(s)- / Aqueous solutions / Bottom hole temperature /
Methane / Salinity / Solubility /

Abstract by Author (revised)

The solubility of methane in aqueous solutions has been determined over a broad range of temperatures, pressures and salinities. The effect of dissolved carbon dioxide and ethane on methane solubility has been determined at 302 DEG F. The solubility of crude oil and water in methane also has been determined over a broad range of temperatures and pressures. Comparison of experimental methane solubilities with gas/water ratios, salinities, bottom hole temperatures and pressures of geopressure test wells suggests that some formation fluids may be near saturation, while many others seem to be undersaturated. There are unresolved questions about the effects of other dissolved substances such as bicarbonate ion and higher molecular weight hydrocarbons on aqueous methane solubility. Petroleum is soluble in methane. Increasing pressure increases the solubility of crude oil in methane gas. At an elevated pressure, which depends upon the temperature, oil and gas form a single fluid phase.

914. GGIS-100568/R/ / /M/ // //Title- Solvent Extraction of Methane from Simulated
Geopressured-Geothermal Fluids

Subtitle- Sub-Pilot Test Results

Author(s)- / Quong , R. / Otsuki , H.H. / Locke , F.E. /

Publication date- January 14 , 1982

Pagination- 28 Pages

Report/patent- UCID-19291

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Livermore Lab.

Livermore , USA

Descriptor(s)- / Methane / Recovery processes / Reservoir fluids /
Simulation / Sodium chloride /

Abstract by NTIS

The extraction of methane dissolved in 15 wt % sodium chloride solution at 150 deg C and 1000 psi has been demonstrated using n-hexadecane as the solvent in a sub-pilot scale extraction column operated in a continuous, countercurrent flow mode. Greater than 90% recovery of methane was obtained with solvent/brine mass flow ratios in the range of 0.040 to 0.045. The height of an ideal stage in this experimental Elgin-type spray column is estimated to be 1.5 feet. Application of this

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process on actual geopressured fluids is technically feasible, and when combined with direct drive injection disposal is economically attractive. Design and operation of a methane saturated-brine supply system to provide simulated geopressured fluid continuously at 150 deg C and 1000 psi are also described.

915. GGIS-100111/R/ / /M/ / / / /

Title- Some Elements of the Northern Gulf of Mexico Basin
Geopressure Energy Resource

Author(s)- / Myers, R. / Nelson, R. / Howard, J. / Austin, R. /

Pagination- 27 Pages

Report/patent- UCRL--74807-1

Corporate Author- Lawrence Livermore Lab.

California University, Livermore, California, USA

Descriptor(s)- / Cost / Economics / Geopressured reservoirs /
Geopressured zones / Geothermal energy conversion / Louisiana /
Methane / Power potential / Resource assessment / Texas / Total
flow systems /

Abstract by Author

It is the purpose of this paper to consider the order of magnitude of the stored energy in the geopressured regions of Louisiana and Texas, to outline representative power cycles for the conversion of this stored energy, to consider the economics of the situation, and to propose the additional work necessary for a meaningful evaluation.

916. GGIS-100528/O/ / /A/ / / / /

Title- Some Pleasant Bayou Area, Brazoria County, Texas, Brine
Injection Experience

Author(s)- / Knutson, Carroll F. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 101, 3 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-
Ref.

Descriptor(s)- / Brazoria County / Brine treatment / Brines /
Environmental impacts / Tertiary Period / Texas / Waste disposal
/

Abstract by GGIS

A DOE study of brine disposal in Texas and Louisiana (Knutson and Boardman, 1977), an EPA study of brine injection in Brazoria County, Texas, and industry experience with brine injection provided the information for this report. General and specific problems relating to brine disposal are discussed, and the case of Monsanto's large volume subsurface fluid injection system is presented.

917. GGIS-100355/J/ / /A/ / / / /

Title- Sonic Log Waveforms from a Geothermal Well in Brazoria County, Texas

(Paper no. GT-12)

Author(s)- / Bachus , Milo M. / Castagna , John / Gregory , A. R. /

Publication date- Vol. 45 , Issue 4 , April 1980

Pagination- Page 587 , 1 Pages

Note- Abstract only of a paper presented at the 49th Annual International Meeting and Exposition, Society of Exploration Geophysicists, New Orleans, Louisiana, Nov. 4-8, 1979

Local Availability- Geol.

Corporate Author- Texas Univ., Austin

Austin , Texas , USA

Descriptor(s)- / Aquifers / Compaction / Depth / Drill stem testing / Elevated temperature / Frio formation / Geopressured reservoirs / Geopressured zones / Gulf Coast / Natural gas / Permeability / Porosity / Pressure gradients / Reservoir properties / Salinity / Sandstone / Temperature gradients / Texas / Well logging /

Abstract by Author

Ongoing geopressured geothermal energy research at the University of Texas has identified several fairway areas containing large volumes of sandstone at temperatures of 300 DEG F, or higher, with abnormally high-pressure gradients at depths of below 8000 ft. These fairways may contain locations suitable for future well drilling. It is believed that aquifers within the geopressured environment of the Gulf Coast may contain significant quantities of dissolved natural gas, in addition to the thermal and kinetic energy of the water, for use as a future energy alternative. Intensive investigations into two of these fairway areas in the Frio formation, the Corpus Christi and Armstrong fairways of central and south Texas, have been undertaken using well log, drillstem test and core data, to attempt to refine porosity-permeability relationships, temperature gradients, pressure gradients at depth, and salinity variations within the geopressured zones. Results indicate decreasing salinity with depth in the geopressured zones, and varying trends of compaction of sediments in the Frio formation. These variations affect location of top of geopressure and pressure gradients in each area, and appear to be related to depositional environments and other factors. Results differ substantially from previously published data on Miocene age sediments in south Louisiana. These results should allow investigators to more accurately and easily determine reservoir parameters within the geopressured Frio formation in central and south Texas.

918. GGIS-100392/R/ / /M/ / / / /

Title- Sourcebook on the Production of Electricity From Geothermal Energy

Author(s)- / Kestin , Joseph / DiPippo , Ronald / Khalifa , H. Ezzat / Ryley , D. John /

Publication date- March 1980

Geopressured Geothermal Bibliography

Pagination- 1014 Pages

Report/patent- DOE/RA/4051-1

Available- Superintendent of Documents

U.S. Government Printing Office

Washington

DC

USA

20402

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA). Div. of

Geothermal Energy

EY-76-S-4051.A002 /

Corporate Author- Brown Univ.

Providence, RI, USA

Auxiliary expression(s)-

Illus. / Diagram (154) / Photo (28) / Graph (220) / Map (10) / Figure (1) /

Table

Ref.

Descriptor(s)- / Corrosion / Design / Economics / Electric power / Environmental effects / Fluid flow / Geology / Geophysics / Geopressured systems / Geothermal drilling / Geothermal energy conversion / Geothermal power plants / Heat transfer / Performance / Power generation / Site selection / Thermodynamics / Waste heat / Well logging / Working fluids / Mass transfer /

Abstract by GGIS

A unification of expert knowledge drawn from a wide variety of specialized fields is presented to develop an integrated view of geothermal energy. The geology and geophysics of geothermal areas, geothermal exploration, reservoir mechanics and reservoir modeling are discussed. Drilling, well logging and fluid flow are described. The thermodynamic principles of energy conversion are discussed as they relate to geothermal installations. The concept of available work emphasized here demonstrates the importance of the heat-rejection system in a geothermal installation. Established and developmental energy conversion systems are discussed. Materials selection guidelines are presented. Economic considerations governing the choice among alternative power systems are examined. Criteria for site selection and design are presented. Statutes and technical problems relating to environmental considerations are described. The final chapter, presenting a compendium of information on geothermal power plants that now exist, once existed, or are planned in the foreseeable future, is a condensation of a companion volume, GEOTHERMAL ENERGY AS A SOURCE OF ELECTRICITY, by Ronald DiPippo

1919. GGIS-100552/R/ / /M/ / / / /

Title- Standardization of Sampling and Analysis of Geopressured Fluids

Subtitle- Part II: Monitoring of Geopressured Wells

Author(s)- / Karkalits, O.C. / Hankins, B.E. /

Publication date- August 1981

Pagination- 91 Pages

Report/patent- PB82-216110

Available- NTIS

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRI-5080-321-0301 /

Corporate Author- McNeese State Univ.

Lake Charles, LA, USA

Descriptor(s)- / Brines / Chemical analysis / Data analysis / Fluids /
Gases / Geopressured reservoirs / Geothermal fluids /
Statistical models / Well monitoring /

Abstract by NTIS

Chemical analyses of geopressured fluids (brine and gas) obtained from seven wells are reported. The analyses were made by the on-site chemical sub-contractor and collaborating research laboratories. McNeese State University served as quality control contractor for GRI. McNeese sent aliquots of the samples (referred to as "round robin" samples) to the collaborators for quality control check analyses. The data have been collated and subjected to a statistical study. Based on these data, recommendations have been made regarding future quality control measures and possible revisions of the Standard Procedures Manual.

920. GGIS-100230/R/ / /M/ / / / /

Title- State of the Art in Well Completion Technology as Applied to Geothermal Development

Subtitle- Preliminary Report

Author(s)- / Jorda, R. M. / Ellis, R. C. /

Publication date- November 1977

Pagination- 160 Pages

Report/patent- SAND--78-7008

Sponsor- / EY-76-C-04-0789 /

Corporate Author- Completion Technology Co.

Houston, Texas, USA

Descriptor(s)- / Corrosion / Disposal wells / Geopressured wells /
Injection wells / Scaling / Scaling control / Well completion /

Abstract by TIC

The preliminary phase of a state-of-the-art report concerning well completions for geopressured and geothermal energy source and injection wells is presented. The report covers corrosion and metal problems, scale deposition and control, general production interval completion techniques, and a model of an all-liquid heat recovery system. Both hot water geopressured source wells and water disposal (injection) wells are discussed in some detail. Areas for further development and study with regards to United States Gulf Coast geopressured well completions are identified. (JGB)

921. GGIS-100256/R/ / /A/ / / / /

Title- State Geothermal Laws and Regulations

(Paper 13 in Geothermal Energy; A National Opportunity (The Federal Impact))

Author(s)- / Sacarto, D. M. / Wonstolen, K. A. / Polich, G. /

Geopressured Geothermal Bibliography

Publication date- 1978

Pagination- 28 Pages

Report/patent- NP--23437

Descriptor(s)- / Alaska / Arizona / California / Colorado / Energy
source development / Geothermal resources / Geothermal industry
/ Idaho / Land leasing / Laws / Leasing / Legal aspects /
Louisiana / Montana / Nevada / New Mexico / Oregon / Regulations
/ State Government / Texas / Utah / Washington / Wyoming /

922. GGIS-100247/R/ / /M/ / / / /

Title- State Policies for Geothermal Development

Subtitle- Uncovering a Major Resource

Author(s)- / Sacarto , Douglas M. /

Publication date- November 1976

Pagination- 104 Pages

Report/patent- PB-261 744

Available- NTIS

(Microfiche)

Local Availability- CES

Corporate Author- National Conference of State Legislatures
Denver , Colorado , USA

Descriptor(s)- / Energy source development / Economics / Energy
policy / Geothermal resources / Government policies /
Institutional aspects / State government /

Abstract by EIC

Policies suited to the development of new energy sources and ideas for enhancing the development of geothermal resources are discussed. Various technical, economic, and institutional aspects of geothermal development are reviewed. Research results from several specialists are summarized, and present state and federal policies affecting the geothermal industry are outlined. Key policy areas are identified, and specific actions are suggested for the states.

923. GGIS-100208/R/ / /M/ / / / /

Title- State Policies for Geothermal Development

Author(s)- / Sacarto , D. M. /

Publisher- National Science Foundation
Washington, D. C.

Publication date- 1976

Pagination- Page 104

Report/patent- NSF/RA--760230

Corporate Author- National Conference of State Legislatures
Denver , Colorado , USA

Descriptor(s)- / Alaska / Arizona / California / Colorado / Economics
/ Energy policy / Geopressured systems / Geothermal energy /
Geothermal exploration / Geothermal resources / Global aspects /
Government policies / Hawaii / Idaho / Land leasing / Legislation
/ Louisiana / Montana / Nevada / New Mexico / Oregon / Origin /
Regulations / Taxes / Texas / USA / Utah / Washington / Wyoming /

Abstract by DOE/RECON

The most prominent geothermal resources in the U. S. A. occur in fifteen Gulf and western states including Alaska and Hawaii. In each state, authority and guidelines have been established for administration of geothermal leasing and for regulation of development. Important matters addressed by these policies include resource definition, leasing provisions, development regulations, water appropriation, and environmental standards. Some other policies that need attention include taxation, securities regulations, and utility regulations. It is concluded that conditions needed for the geothermal industry to pursue large-scale development are consumer (utility) confidence in the resource, equitable tax treatment, prompt exploration of extensive land areas, long and secure tenure for productive properties, prompt facility siting and development and competitive access to various consumers. With these conditions, the industry should be competitive with other energy sectors and win its share of investment capital. This publication reviews for the states various technical, economic, and institutional aspects of geothermal development. The report summarizes research results from numerous specialists and outlines present state and federal policies. The report concludes generally that if public policies are made favorable to their development, geothermal resources offer an important energy resource that could supply all new electric capacity for the fifteen states for the next two decades. This energy--100,000 MW--could be generated at prices competitive with electricity from fossil and nuclear power plants. An extensive bibliography is included. (MCW)

924. GGIS-100292/R/ / /M/ / / / /

Title- State-of-the-Art Hydrogen Sulfide Control for Geothermal Energy Systems

Subtitle- 1979

Author(s)- / Stephens , Frederick B. / Hill , John H. / Phelps , Paul L., Jr. /

Publication date- March 1980

Pagination- 134 Pages

Report/patent- DOE/EV-0068

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA). Div. of Environmental Control Technology
W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Livermore Lab.

Livermore , CA , USA

Auxiliary expression(s)-

Illus. / Diagram (18) / Photo (3) / Map (4) / Graph (19) /

Table

Ref.

Descriptor(s)- / Air pollution abatement / Dissolved gases / Environmental effects / Gaseous wastes / Geothermal energy

conversion / Hot water systems / Hydrogen sulfides / Pollution control / Pollution control equipment / Pollution regulations / Stack disposal / Technology assessment / Vapor dominated systems / Water pollution abatement /

Abstract by Author

Present efforts by the geothermal industry are directed toward developing economically viable hydrogen sulfide emission control technologies having efficiencies that satisfy federal and state emission control requirements. This report discusses existing state-of-the-art technologies for removal of hydrogen sulfide along with a comparative assessment of their efficiencies, reliabilities and costs. Other related topics include the characteristics of vapor-dominated and liquid-dominated resource, energy conversion systems, and the sources of hydrogen sulfide emissions. The report indicates that upstream control technologies are preferred over downstream technologies primarily because upstream removal of hydrogen sulfide inherently controls all downstream emissions including steam-stacking. Two upstream processes for vapor-dominated resources appear promising; the copper sulfate (EIC) process, and the steam converter (Coury) process combined with an off-gas abatement system such as a Stretford unit. For liquid-dominated systems that produce steam, the process where the non-condensable gases are scrubbed with spent geothermal fluid appears to be promising. An efficient downstream technology is the Stretford process for non-condensable gas removal. In this case, partitioning in the surface condenser will determine the overall abatement efficiency. Recommendations for future environmental control technology programs include a) studies addressing H₂S emissions associated with steam stacking, b) examining the use of the Stretford process upstream, c) continuing studies of the steam converter (Coury) process, d) determining the feasibility of electrolytic processes for hydrogen sulfide removal and, e) a follow-up program of the DOE sponsored ASCOT study.

925. GGIS-100325/R/ / /M/ / / / /

Title- State-of-the-Art Review of Geothermal Reservoir Modelling

Author(s)- / Pinder, George F. /

Publication date- March 1979

Pagination- 144 Pages

Report/patent- LBL-9093

Available- NTIS

(Paper Copy)

Local Availability- CES

Sponsor- / U.S. Department of Energy

W-7405-ENG-48 /

Corporate Author- California Univ., Berkeley

Lawrence Berkeley Lab.

Berkeley, California, USA

Auxiliary expression(s)-

Illus. / Figure (10) /

Ref.

Descriptor(s)- / Deformation / Energy transfer / Equations / Fluid flow / Geothermal reservoirs / Ground subsidence / Mathematical models /

Abstract by Author

The simulation of subsidence in a geothermal reservoir involves the solution of equations governing fluid movement, energy transport, and reservoir skeleton deformation. The three phenomena are, of course, coupled and in the most rigorous formulation would be considered and approximated as a single system. In practice, however, deformation of the reservoir skeleton has only a minor impact on fluid flow and energy transport whereas these latter phenomena are very important in reservoir deformation. This type of one-way coupling is not unusual in mathematical physics and can be used effectively to enhance the efficiency of a geothermal reservoir subsidence code. The most important consequence of this is a decoupling of the fluid flow and energy transport from the deformation equations such that they can be solved sequentially rather than simultaneously without the introduction of significant error. Thus, the geothermal reservoir model, exclusive of skeletal deformation, can be viewed and analyzed meaningfully as a separate entity. The objective of this report is to summarize and, to the degree possible, evaluate the state of the art in geothermal reservoir modelling. As used herein the term geothermal reservoir model refers to the representation of the dynamics and thermodynamics of a geothermal reservoir, without skeletal deformation, using the concepts of porous flow physics and the subsequent solution of the resulting assemblage of differential and partial differential equations. Only those models which have been developed exclusively for geothermal simulation will be considered within the scope of this report.

926. GGIS-100514/R/ / /M/ / / / /

Title- State-of-the-Art Study of Drilling Problems in Selected Shales

Author(s)- / Reineke, R. C. /

Conference- DOE Symposium on Enhanced Oil and Gas Recovery and Improved Drilling Technology

Tulsa

OK

USA (August 22 , 1979)

Publication date- 1979

Pagination- 14 Pages

Report/patent- CONF-790805-11

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Department of Energy, Washington, D.C. (USA)

EY-76-C-04-0789 /

Corporate Author- Sandia Labs

Albuquerque, NM, USA

Descriptor(s)- / Cost / Drilling / Economics / Geopressured systems / Natural gas / Oklahoma / Shale / Technology assessment /

Abstract by NTIS

The Stanley formation of southeastern Oklahoma is believed to contain large quantities of natural gas. Due to the high cost

of drilling this formation and due to the low gas production rate from the sands, it is not economical to produce from this formation at the present time. One possible approach to reducing drilling costs is to drill with air and take advantage of the higher penetration rate obtainable. However, this approach tends to create additional problems associated with borehole stability and hole cleaning. This paper will summarize the results of a state-of-the-art study which was directed toward shale drilling problems, air drilling problems, and their reported solutions. Also, future plans for investigating the effects of various drilling fluids on selected samples of shale will be presented.

927. GGIS-100002/O/ / 3/A/ // //

Title- Statistical Study of Geopressured Reservoirs in Southwest Louisiana

Author(s)- / Perry , D. J., JR. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 3 , 1972

Pagination- Page 115 , 3 Pages

Descriptor(s)- / Louisiana / Engineering geology / Geopressured reservoirs / Overburden pressure / Southwest / Gulf Coast / Natural gas / Pressure buildup / Distribution / Statistical methods / Tertiary / United States /

928. GGIS-100467/R/ / /M/ // //

Title- Steady-State and Transient Wellbore Temperatures During Drilling

(Task 1: Analysis of Heat Flow)

Subtitle- Development of an Improved Geothermal Drill Bit

Author(s)- / McDonald , William J. /

Publication date- May 20 , 1976

Pagination- 33 Pages

Report/patent- TID-28777

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy

ERDA E(10-1)-1546 /

Corporate Author- Terra Tek, Inc.

Salt Lake City , Utah , USA

Auxiliary expression(s)-

Illus. / Diagram (4) / Graph (11) /

Table

Ref.

Descriptor(s)- / Boreholes / Bottom hole temperature / Circulating rate / Comparative evaluations / Computer codes / Drill bits /

Drilling / Drilling fluids / Engineering / Geothermal drilling /
Heat transfer / Numerical analysis / Recommendations /
Temperature control / Temperature measurement / Well drilling /
Abstract by Author (revised)

An extensive literature search was made to locate technical publications and computer programs relating to wellbore temperatures during drilling operations. Examples in these publications confirmed the need for knowledge of transient and steady state circulating temperatures in the design of geothermal bits. Two approaches were used in calculating borehole temperatures: the steady state solution of Holmes and Swift was programmed and 2100 cases calculated for various borehole configurations. For transient temperature studies, Exxon Production Research Co. made calculations for ten borehole configurations. These calculations help emphasize the need for better high temperature bit performance and improved engineering procedures in drilling. Conclusions and recommendations are based on the understanding that as geothermal wells and hot oil and gas wells become increasingly common, technology and information regarding wellbore temperatures must be developed.

929. GGIS-100314/R/ / /M/ / / / /

Title- Steady-State and Transient Wellbore Temperatures During Drilling

Author(s)- / McDonald , William J. /

Publication date- May 20 , 1976

Pagination- 37 Pages

Report/patent- TID--28777

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / U.S. Energy Research and Development Administration

EY-76-C-07-1546 /

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (13) /

Table

Ref.

Descriptor(s)- / Bottom hole temperature / Computer calculations /
Design / Drill bits / Drilling fluids / Geothermal drilling /
High temperature /

Abstract by Author

An extensive literature search was made to locate technical publications and computer programs relating to wellbore temperatures during drilling operations. Examples in these publications confirmed the need for knowledge of transient and steady state circulating temperatures in the design of geothermal bits. Two approaches were used in calculating borehole temperatures-- the steady state solution of Holmes & Swift was programmed and 2100 cases calculated for various borehole configurations. For transient temperature studies, Exxon Production Research Co. made calculations for ten borehole configurations under a \$5,000 subcontract. These calculations help emphasize the need for better high temperature bit performance and improved engineering procedures in drilling.

930. GGIS-100137/R/ / /M/ / / / /

Title- Stimulation of Geothermal Aquifers

Subtitle- Progress Report No. 1

Author(s)- / Kruger , P. / Ramey , H. J., JR. /

Publication date- March 1973

Pagination- 91 Pages

Report/patent- PB-238 054

Available- NTIS

(Microfiche)

Local Availability- CES

Sponsor- / NSF/RANN

GI-34925 /

Corporate Author- Stanford University

Stanford , California , 94305 , USA

Descriptor(s)- / Geothermal energy / Unconventional energy sources /
Energy source development / Computerized simulation / Models /
Mathematical models / Stimulation / Geopressured reservoirs /
Reservoir engineering / Steam / Environmental impact / Water
quality / Aquifers / Underground explosions / Environmental
effects / Geothermal reservoirs / Simulation / Well stimulation
/

Abstract by NSF/RANN

The three major objectives of this program are: (1) development of experimental and numerical data to evaluate the optimum performance of explosion- stimulated geothermal aquifers; 2) development of a geothermal steam reservoir model to evaluate the many thermophysical, hydrodynamic, and chemical parameters involved; and 3) development of a laboratory model of an explosion-produced chimney to obtain experimental data on the processes of in-place boiling, moving flash fronts, and two-phase flow in hot porous media, as well as chemical and radiochemical data for the fluids production. The progress achieved during this initial period of the project is reported in this first progress report. (Auth, from introduction)

931. GGIS-100528/O/ / /A/ / / / /

Title- Structural Evolution of Three Geopressured-Geothermal Areas in the Texas Gulf Coast

Author(s)- / Winker , Charles D. / Morton , Robert A. / Garcia , Deborah D. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 59 , 7 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AS05-76ET28461; DE-AC08-79ET27111 /

Auxiliary expression(s)-

Illus. / Map (5) /

Table

Ref.

Descriptor(s)- / Aquifers / Data / Geologic structures / Geopressured zones / Gulf Coast / Sandstone / Seismic surveys / Shale / Texas /

Abstract by Author

Detailed analysis of geological and seismic data from several geopressured geothermal areas (Cuero, Blessing, Pleasant Bayou) reveals similarities in structural stratigraphic relationships that form geopressured aquifers as well as differences in structural complexity and evolution that characterize the different areas. In these examples, geopressured sandstones are isolated on the updip side by downfaulting against shelf-slope shales, and on the downdip side by upfaulting against transgressive marine shales. Moreover, they are isolated above and below by thick sequences of transgressive shale or interbedded sandstone and shale. Prospective reservoirs are found where deltaic and associated sandstones (distributary channel, delta front, barrier-strandplain) were deposited seaward of major growth faults and near the shelf margin. Structural development in these areas began with rapid movement of relatively straight to sinuous down-to-the-basin growth faults with narrow to wide spacings and varying amounts of rollover. Later structural movement was characterized by continued but slower movement of most growth faults. In the Pleasant Bayou area, late salt diapirism superimposed a dome-and-withdrawal-basin pattern on the earlier growth-fault style.

932. GGIS-100528/0/ / /A/ / / / /

Title- Structural Geology of "Wells of Opportunity" Tested During 1980 and 1981

Author(s)- / Peterson, Kim P. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 163, 8 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy
DE-AC08-80ET27081 /

Auxiliary expression(s)-

Illus. / Diagram (7) / Map (8) /
Ref.

Descriptor(s)- / Faulting / Geopressured reservoirs / Permeability barriers / Testing / US DOE / Wells of opportunity /

Abstract by Author

Six geopressured-geothermal reservoirs have been tested by Eaton Operating Company, Inc., under the Department of Energy's Wells of Opportunity program. These reservoirs have been isolated in one or more directions by down-to-the-coast growth-type faulting. The two main types are those bounded updip by a single sealing fault and anticlinal traps bounded both up and down dip of the structure. Additional permeability barriers were encountered during testing. These barriers were not

predicted in the original geologic evaluations and show the need to seek larger reservoirs in future tests.

933. GGIS-100528/0/ / /A/ / / / /

Title- Structural-Stratigraphic Setting of LaFourche Crossing Prospect, Louisiana

Author(s)- / Snyder, Franklin C. / Pilger, Rex H. /
Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 233, 4 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (2) / Map (4) /

Ref.

Descriptor(s)- / Geologic structures / Louisiana / Miocene Epoch /
Seismic reflection surveys / Stratigraphy / Well data /

Abstract by GGIS

The structural-stratigraphic setting of the LaFourche Crossing Prospect in Louisiana is presented. A detailed analysis has shown several fault blocks that limit the size of any potential geopressured-geothermal reservoirs. The three reservoir units of potential interest are the Plater, the Ridgefield, and the Bokenfohr.

934. GGIS-100528/0/ / /A/ / / / /

Title- Structural-Stratigraphic Setting of South Freshwater Bayou Prospect, Vermillion Parish, Louisiana

Author(s)- / Cavanagh, Thomas / Pilger, Rex H. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 241, 3 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-79ET27019 /

Auxiliary expression(s)-

Illus. / Diagram (2) / Map (1) /

Ref.

Descriptor(s)- / Functional models / Geopressured zones / Louisiana /
Sandstone / Stratigraphy / Structural geology / Vermilion Parish /

Abstract by Author

The primary reservoir targets in South Freshwater Bayou Prospect are sands whose deposition appears to have been structurally controlled. The growth of a deep domal feature localized deepwater sand deposition on its flanks, thereby producing a significant thickness of subsequently geopressured sandstone. The area is, therefore, not only prospective in its

own right, but provides an exploration model for other
geopressured geothermal prospects.

935. GGIS-100073/B/ / /M/ / / / /

Title- Structure, Stratigraphy and Petroleum Potential of the
Northern Gulf of Mexico
Publisher- Houston Geological Society
Houston, Texas (U.S.A.)
Publication date- 1974

936. GGIS-100393/O/ / /A/ / / / /

Title- Study of a Geopressured Reservoir by Drilling and Producing a
Well in a Limited Geopressured Water Sand
Author(s)- / Hamilton, John R. / Wilson, John S. /
Publisher- 4th Geopressured Geothermal Energy Conference
Publication date- Vol. 3, June 1980
Pageination- Page 1137, 23 Pages
Available- Center for Energy Studies
University of Texas at Austin
ENS 143
Austin
TX
USA
(Paper copy)
Local Availability- CES
Corporate Author- Dow Chemical Co.
Freeport, TX, USA
Auxiliary expression(s)-
Illus. / Diagram (3) / Map (3) / Figure (2) /
Table
Descriptor(s)- / Aquifers / Areal geology / Evaluation / Field studies
/ Drilling / Installation / Louisiana / Pressure decline /
Reservoir description / Sand / Test wells /
Abstract by Author
A 13,600' well will be drilled in Parcperdue field, near
Lafayette, Louisiana, to test a small, geopressured water sand.
Excellent geologic control of the fault block and uniformity of
the reservoir sand will afford detailed analysis of reservoir
behavior. The data generated will permit extrapolation to
predict the performance of larger reservoirs. Water will be
produced through 5-1/2" tubing at rates up to 25,000 bbl/day.
The completion will be a cased hole gravel pack. The disposal
well will be a 5,000' open hole gravel pack. The testing program
will include detailed logging, coring and core analysis,
analytical chemistry of water and gas, and PVT analyses.
Pressure testing will consist of a short-term, 2-week series of
four, staged isochronal pressure drawdown and buildup tests,
followed by a long-term production test of approximately 9
months' duration. Periodic pressure buildup monitoring will be
done during the long-term testing. A Hewlett-Packard
temperature-pressure gauge will be utilized for both short- and
long-term pressure testing.

937. GGIS-100433/R/ / /M/ / / / /

Title- Study of Information/Educational Discussions with Private Industries and Public Institutions on the Direct-Heat Utilization of Geothermal Energy

Subtitle- Survey Report

Author(s)- / Davey, James V. /

Publication date- March 1977

Pagination- 29 Pages

Report/patent- LBL-5988

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Energy Research and Development Administration, Washington, D.C. (USA) /

Corporate Author- California Univ.

Lawrence Berkeley Lab.

Berkeley, USA

Auxiliary expression(s)-

Illus. / Graph (3) / Map (1) /

Table

Ref.

Descriptor(s)- / Agriculture / California / Cost / Direct energy utilization / East Mesa KGRA / Industry / Public opinion /

Abstract by Author

This summary is the result of a four-month study of private and public institutions' response to the proposed use of geothermal energy in the form of direct heat. This heat energy is to be used as an alternate or supportive source for their process or other heat requirements. The summary includes information from over 75 personal contacts with firms in several categories. No attempt is made to reference specific data to any particular company. Although not necessarily confidential, some financial information concerning energy costs to profits was considered sensitive and is respected as such. The companies contacted have been incorporated into the East Mesa Test Facility mailing list. The companies contacted are in several categories, as follows: (1) food processing -- canning, drying, dehydration; (2) chemicals; (3) paper/wood-pulp processing; (4) food machinery; (5) horticulture; (6) dairy. The area covered in the study was from Seattle, Washington to San Diego, California, during mid-1976. Industry's response varied from mild interest, as with corporations that had little or no knowledge of geothermal energy (and regard it as a new unproven science) to enthusiastic from corporations that employ their own energy departments. These enthusiastic corporations recognize the future energy crisis in fossil fuels and are seeking alternatives. However, geothermal science is still fairly vague. The study clearly indicated the important areas of need for aiding the development of this valuable resource. Those needs are: (1) an intense basic educational program; (2) an operating demonstration project (industrial park) to prove economic feasibility and instill confidence in the potential of geothermal energy.

938. GGIS-100447/R/ / /M/ / / / /

Title- Study of Silica Scaling from Geothermal Brines

Subtitle- Final Report for Period November 15, 1974 -- April 30, 1977

Author(s)- / Makrides , A. C. / Turner , M. J. / Harvey , W. W. / Slaughter , J. / Brummer , S. B. / Offenhartz , P. O'D. / Pearson , G. F. /

Publication date- January 1978

Pagination- 78 Pages

Report/patent- COO-2607-5

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy

EY-76-C-02-2607 /

Corporate Author- EIC Corp.

Newton , MA , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (23) /

Table

Ref.

Descriptor(s)- / Chemical analysis methods / Chemical reactions / Experimental results / Geothermal brines / Measuring methods / pH dependence / pH value / Precipitation / Salinity / Salts / Scaling / Scaling control / Silica minerals / Solutions / Supersaturation / Temperature /

Abstract by Author

Condensation of silica from brines supersaturated in silicic acid was studied over a range of pH (4.5-6.5), temperature (75-105 deg C), salinity, and silicic acid concentration (700 to 1200 ppm as SiO₂). The experimental technique involved analyses for molybdate-reactive silicic acid as a function of time after a supersaturated solution of Si(OH)₄ was prepared by mixing aliquots or a stock silicate solution with buffered brine. The isothermal rate of SiO₂ condensation is a strong function of supersaturation (C/Ce), pH, and salinity. The overall kinetics follow what is expected from the general theory of phase transitions. At supersaturations less than about 3, there is an apparent transition period during which the rate of removal of silicic acid from solution is below the detection limit of the analytical technique. This period amounts to several hundred minutes at supersaturations of about 2.0. The kinetic results suggest that growth of nucleated particles is activation controlled, at least initially. The primary nuclei have radii on the order of a few angstroms. Particles of several hundred angstroms are produced eventually. The increase of condensation rate with salt content is attributed to a decrease in equilibrium solubility of SiO₂. In effect, higher salt concentrations increase supersaturation and lead to faster nucleation. Higher nucleation and growth rates are observed at higher pH's. An increase of 1 pH unit increases rates by a factor of about 10. The pH dependence is consistent with the hypothesis that SiO(OH)₃⁻ is one of the reacting species. Temperature (75-105

deg C) has little effect on condensation rate at a fixed initial silicic acid concentration. This result suggests that the increase in rate of activated steps brought about by increased temperature is essentially counterbalanced by a decrease in supersaturation (because of higher equilibrium solubility at higher temperatures). The kinetic results yield an activation energy of 17 kcal/mol for addition of silicic acid to a nucleated particle and 45 ergs/cm² for the interfacial energy between precipitated silica and the brine. NaCl, KCl, CaCl₂ and MgCl₂ had no specific effect on condensation rate. However, NaF had a large effect on rate; a few ppm (15-100) of fluoride ion accelerate condensation substantially.

939. GGIS-100547/R/ / /M/ / / / /

Title- Study Effects of Geopressured-Geothermal Subsurface Environment on Elastic Properties of Texas Gulf Coast Sandstones and Shale Using Well Logs, Core Data, and Velocity Surveys

(Final Report)

Author(s)- / Gregory , A.R. /

Publication date- May 1980

Pagination- 247 Pages

Report/patent- DOE/ET/28468-T1

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

AS05-78ET28468 /

Corporate Author- Texas Univ.

Bureau of Economic Geology

Austin, USA

Descriptor(s)- / Data / Downhole sampling / Earth core / Elasticity / Permeability / Pleasant Bayou No.1 Well / Pleasant Bayou No.2 Well / Porosity / Reservoir properties / Velocity / Well logging /

Abstract by NTIS

Relations between porosity and permeability for the Pleasant Bayou wells were determined from conventional core data. Porosities from the time average equations required compaction correction factors of 1.9 in hydro pressured sandstone and 1.0 in geopressured sandstones. Best average permeabilities in the geopressured zone were found in the primary production interval 14,687 to 14,716 ft (4477 to 4485 m). Average density gradients were 2.106×10^{-3} and 2.688×10^{-3} (gm/cm³)/100 ft in sandstones and shales respectively. Compressional (P-wave) and shear (S-wave) velocities from the long-spaced sonic log and bulk densities from the formation density log were used to compute in-situ elastic moduli, Poisson's ratio, V_p/V_s , and bulk compressibility in two intervals of deep geopressured sandstone and shale in No. 2 Pleasant Bayou. Most computed values of these parameters seem reasonable. Improved accuracy of travel times from the long-spaced sonic log should permit more accurate depth-to-time correlation with seismic data.

940. GGIS-100528/O/ / /A/ / / / /

Title- Subsidence and Induced Faulting

Subtitle- Key Environmental Issues in Geopressured-Geothermal Resource Development

Author(s)- / Van Sickle, V.R. / Groat, C.G. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 325, 6 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

DE-AC08-81NV10174 /

Auxiliary expression(s)-

Illus. / Figure (2) / Map (2) /

Ref.

Descriptor(s)- / Environment / Environmental impacts / Faulting / Geopressure resources / Geothermal resources / Ground subsidence / Resource development /

Abstract by Author

A combination of natural processes and man's activities has increased subsidence rates and faulting in several areas of coastal Louisiana and Texas. Subsurface stress caused by the withdrawal of large volumes of fluid has been shown to accelerate subsidence and fault movement in some cases. To evaluate the effects of geopressured-geothermal fluid withdrawals, background rates of ground movement must be determined and compared with rates of movement during and after fluid production. A program for monitoring subsidence and faulting, which is based on microseismic monitoring, tiltmeter monitoring, and repeated leveling surveys, is underway at the U.S. Department of Energy's designed geopressured-geothermal test well sites in Louisiana and Texas. Changes in subsidence rates and fault activity which can be attributed to geopressured-geothermal fluid withdrawal must be of sufficient magnitude to be distinguished from background activity.

941. GGIS-100393/O/ / /A/ / / / /

Title- Subsurface Disposal of Geopressured Fluid: Potential Geologic and Operational Problems with Recommendations for Disposal System Testing

Author(s)- / Bachman, Ann L. / Smith, Charles G., Jr. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 2, June 1980

Pagination- Page 972, 28 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS

Austin

TX

78712

(Paper copy)

Geopressured Geothermal Bibliography

Local Availability- CES

Corporate Author- Louisiana State Univ.
Baton Rouge , USA

Auxiliary expression(s)-
Ref.

Descriptor(s)- / Disposal wells / Faulting / Geopressured wells /
Geothermal fluids / Hydrogeology / Injection wells / Injectivity
/ Louisiana / Migration / Monitoring / Operation / Performance
testing / Subsidence / Testing / Underground disposal / Waste
disposal /

Abstract by Author

This paper reports the results of the Workshop on Subsurface Disposal of Geopressured Fluids held at Louisiana State University, March 6-7, 1979. The LSU Workshop was the first to specifically address, in a group discussion format, the potential geological and operational problems of subsurface disposal of geopressured fluids. The participants represented a wide range of expertise and included the major industry representatives and researchers in the field. The conclusions and recommendations of this group are discussed in this paper in three areas: (1) potential hydrogeologic and fluid-formation compatibility problems; (2) operational factors; and (3) the potential for fluid migration. The paper also describes the disposal system testing program that was developed as a result of issues raised during the Workshop. The program is part of a geopressured test well that has been proposed by the Louisiana Department of Natural Resources for a prospect near Lafourche Crossing in Terrebonne Parish, Louisiana. The goals of the program are (1) to test the efficiency of the wells before disposal begins, (2) to evaluate potential fluid migration/compatibility problems; (3) to monitor the performance of the wells during injection; and (4) to assess any long-term problems that might develop as a consequence of large volume disposal.

942. GGIS-100411/0/ / 2/A/ / / / /

Title- Subsurface Technology and Resource Utilization
(4th Volume)

Author(s)- / Underhill , Gary K. / Carlson , Ronald A. / Glendenning
/ Williams A. / Erdos , Jozsef / Gault , John A. / Hall , James
W. / Jones , Robert L. / Michael , Herbert K. / Powell , Paul
H. / Riemann , Carl F. / Rios-Castellon , Lorenzo / Shepherd ,
Burchard P. / Wilson , John S. /

Conference- 2nd Geopressured Geothermal Energy Conference
Austin
Texas
USA

Publication date- Vol. 2 , February 25 , 1976

943. GGIS-100052/J/ / /A/ / / / /

Title- Subsurface Water

Subtitle- Tool for Petroleum Exploration

Author(s)- / Ostroff , A.G. /
 Publication date- Vol. 15 , Issue 1 , February 1975
 Pagination- Page 50 , 15 Pages
 Auxiliary expression(s)-
 Illus. / Figure (7) /
 Table
 Ref.
 Descriptor(s)- / Chemical properties / Geopressed zones /
 Hydrocarbons / Petroleum exploration / Physical properties /
 Subsurface waters / Water /
 Abstract by WRA

The close association of hydrocarbon accumulations with subsurface waters has led to the use of properties of these waters as a secondary exploration tool. Both chemical and physical characteristics of subsurface waters has made a significant contribution to the accumulation of petroleum. In addition to dissolved organic and inorganic constituents, hydrodynamic movement, oxidation-reduction potentials, and water classification systems have been utilized in locating permeability barriers, faults, geopressed zones, and unconformities. Examples of water as an exploration tool are given.

 944. GGIS-100123/ / / 8/M/ / / /

Title- Summary and Conclusions

(Chapter 7 in Assessment of Geothermal Resources of the United States - 1975)

Author(s)- / White , D. E. / Williams , D. L. /

Publication date- 1975

Corporate Author- U.S. Geological Survey

Auxiliary expression(s)-

Illus.

Descriptor(s)- / Geothermal resources / Geothermal energy / Geo brine / Hot water /

Abstract by Energyline

The geopressed fluids of the Gulf Coast have a huge geothermal potential. Much of this resource is probably paramarginal under present conditions, but some part is probably recoverable now from areas where the environmental impact is low. The high temperature convection systems (greater than 150 degrees C.) of interest for the generation of electricity are predominantly in the western conterminous U. S., but some are in Alaska and Hawaii. The intermediate temperature convection systems (90-100 degrees C.) have much potential for supplying geothermal energy for home and industrial heating, thereby releasing oil and gas for more critical use. The hot igneous magma systems and some areas of high regional temperature gradients provide relatively favorable areas for utilizing the heat of hot dry rock, provided that satisfactory methods of recovery can be developed. Disregarding cost, the total magnitude of geothermal resources that can be recovered by present and near-current technology is very large. The resource base and recoverability are examined. (4 tables)

945. GGIS-100411/O/ / 2/A/ // //

Title- Summary and Future Projections

(1st Volume)

Author(s)- / Dorfman , Myron H. / Deller , Richard W. /
Conference- 2nd Geopressured Geothermal Energy Conference
Austin
Texas
USA

Publication date- Vol. 2 , February 25 , 1976

Pagination- Page 85

Auxiliary expression(s)-

Illus. / Diagram (6) / Map (1) /

Ref.

Table

Descriptor(s)- / Proceedings / Geothermal energy / Geothermal brines
/ Geothermal resources / Research programs / Texas / Geothermal
drilling / Geothermal power plants / Gulf of Mexico / Drilling /
Economics / Environmental effects / Theoretical treatments /
Forecasting / Geothermal wells / Geopressured systems / Snaps /
Tables / Diagrams / Geological setting / Geothermal gradients /
Temperature measurement / Direct energy utilization / Power
generation / Legal aspects /

Abstract by Energyline

Results of an ERDA-sponsored management and scope-of-work study to determine the feasibility of electric power generation through development of geopressured geothermal aquifers underlying the U.S. Gulf Coast are summarized. The study investigated: geological background; resource assessment; well design and reservoir research and technology; methods of resource utilization; and legal, institutional, and environmental factors in resource development. Drilling and completion technology are adequate for successful development of geopressured geothermal wells. Electricity generation is economically and energetically attractive if fluid temperatures, production rates, and methane content approach those assumed in the study--325 degrees F. at well head, 40,000 BPD, and 40 CU. FT./BBL. Recommendations, a time schedule, and cost estimates for further research and technology development are included. (6 diagrams, 1 map, 11 references, 7 tables)

946. GGIS-100393/O/ / /A/ // //

Title- Summary of Flow Tests of Edna Delcambre No. 1:

Subtitle- 1. Summary of Water Analyses

Author(s)- / Hankins , B.E. / Chavanne , Raymond E. / Ham , Russell
A. / Karkalits , O. Carroll / Palermo , Joseph I. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1327 , 20 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX
 USA
 (Paper copy)
 Local Availability- CES
 Sponsor- / Department of Energy, Washington, DC (USA) /
 Corporate Author- McNeese State Univ.
 Lake Charles , LA , USA
 Auxiliary expression(s)-
 Illus. / Diagram (1) /
 Table
 Ref.
 Descriptor(s)- / Chemical analysis / Chemical composition / Dissolved
 gases / Edna Delcambre No. 1 Well / Fluid flow / Geopressured
 wells / Laboratory testing / Louisiana / Surface equipment /
 Vermilion Parish / Water analysis / Well testing /
 Abstract by Author
 DOE funded a proposal by McNeese State University in June 1975 to
 test a shut-in well that penetrated the geopressured zone. The
 McNeese team obtained samples of water from the well and
 determined the chemical composition of each. The amount of gas
 dissolved in the water was determined also. This paper focuses
 on the chemical analyses of the water. A companion paper by Dr.
 O. C. Karkalits presents data on the amount and composition of
 the gas. The Edna Delcambre et al. No. 1, located in Tigre
 Lagoon Field, East Vermilion Parish, Louisiana, was chosen as
 the test well. Two sands at approximately 12,700 feet were
 tested for about 20 days each. A summary of the test equipment
 available and the analyses performed on-site as well as the
 analyses performed at the McNeese laboratories is discussed. A
 comparison of laboratory and in-line pH determinations is made
 in order to show some of the problems involved in testing
 geopressured-geothermal water. Recommendations are made
 regarding the testing of future wells.

 947. GGIS-100393/O/ / /A/ / / / /

**Title- Summary of Industry-Government Conferences and Process
 Heat Market Survey**

**Subtitle- A. Summary of Four Industry-Government Conferences on
 Appropriate Geopressured-Geothermal Initiatives**

**Author(s)- / Prestwood , Donna C.L. / Frederick , David O. / Roberts
 , Kenneth D. / Vanston , John H., Jr. /**

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1574 , 14 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

ET-78-G-05-5959 /

Corporate Author- Texas Univ.

Geopressured Geothermal Bibliography

Center for Energy Studies

Austin, USA

Descriptor(s)- / Commercialization / Energy policy / Financial incentives / Geopressure resources / Industry / Institutional aspects / Legislation / Meetings / Resource development / Texas / Uses /

Abstract by Author

The successful development of the geopressured geothermal resource along the Texas Gulf Coast depends in part on the impacts and mix of incentives offered by governmental agencies; there exists a variety of opinions as to which incentives offer the most motivation to the private sector. This report presents the results of a series of four meetings held on September 5 and 6, 1978, in Houston, Texas, at which incentives were discussed by members of the research team, DOE representatives, and representatives from four categories of potential geopressured-geothermal developers. These categories were: electric utilities and architectural engineering firms, large industrial energy consumers, gas transmission and distribution companies, and energy production companies and financial institutions. All groups viewed geopressured-geothermal as an industry in its initial stages still requiring considerable research and development before it can become economically feasible. Therefore, they endorsed DOE's well-drilling program. They also agreed that current geothermal tax incentives due to expire either in 1982 or 1984 must be extended if they are to have any effect on commercialization. Other areas of concern developed by the participants included applications for geothermal heat and hot water, possible subsidence from deep-well withdrawal, possible aquifer contamination from reinjection, and the geophysical characteristics of geopressured-geothermal formations.

948. GGIS-100393/O/ / /A/ / / / /

Title- Summary of Industry-Government Conferences and Process Heat Market Survey

Subtitle- B. Texas Industrial Process Heat Market Potential for Geopressured Brine

Author(s)- / Roberts, Kenneth D. / Frederick, David O. / Prestwodd, Donna C.L. / Vanston, John H., Jr. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3, June 1980

Pagination- Page 1588, 14 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

ET-78-G-05-5959 /

Corporate Author- Texas Univ.

Center for Energy Studies

Austin , USA
 Auxiliary expression(s)-
 Illus. / Map (1) /
 Table
 Ref.
 Descriptor(s)- / Commercialization / Direct energy utilization /
 Financial incentives / Geopressure resources / Geothermal brines
 / Industrial heating / Industry / Institutional aspects / Market
 / Methane / Process heat / Texas /
 Abstract by Author

The Technology Forecasting and Assessment Division of the Center for Energy Studies at The University of Texas at Austin has for the past year studied the institutional structures and initiatives which must evolve in order to support an accelerated commercialization program for the geothermal resource underlying the Texas Gulf Coast region. As part of this study a market survey of 267 low-grade process heat users was conducted along the 30-county coastal area to define the potential market for thermal or combined thermal-methane components of the resource. The principal findings were; (1) methane is the major fuel of all industry groups, though some substitution of other fuels is anticipated; (2) low anticipated capital replacements and the existence of unused low-grade heat limit the potential market; (3) fuel costs and reliability of supply are primary considerations in purchase of process-heat equipment; (4) geothermal companies, oil companies, and utilities are all acceptable geothermal suppliers, while government agencies are not; and (5) successful commercial application, followed by reservoir insurance, will stimulate participation more than any other government incentives.

 949. GGIS-100555/R/ / /M/ / / / /

Title- Summary of LOGDEX Data Base
Author(s)- / Hill , T. / Sepehrnoori , K. /
Publication date- August 1981
Pagination- 233 Pages
Report/patent- DOE/ET/27018-1-Sum.
Available- NTIS
Local Availability- GGIS
Sponsor- / Department of Energy, Washington, D.C. (USA)
 AS05-76ET28466 & AC08-79ET27018 /
Corporate Author- Texas Univ.
 Center for Energy Studies
 Austin , USA
Descriptor(s)- / Geopressure resources / Gulf Coast / Information
 systems / Louisiana / Oil wells / Potential energy / Texas / Well
 information systems / Well logging / Wells /
Abstract by NTIS

A summary of LOGDEX, the digitized well log data base maintained by the Center for Energy Studies at The University of Texas at Austin is presented. These well logs were obtained from various oil companies and then converted from paper well logs to numeric information on magnetic computer tapes for input into the well log data base. This data base serves as a resource for application programs in the study of geopressured geothermal

energy resources, for well logging research, and for geological research. Currently, the location and scope of well log data that may be found within the LOGDEX data base are limited to wells along the Texas-Louisiana Gulf Coast that are known to have a potential as a geopressured geothermal energy resource. Additionally, the location of these wells in that area is highly localized into areas that have been defined by Department of Energy researchers as having a high potential for geopressured geothermal energy. The LOGDEX data base currently contains data from more than 350 wells, representing more than 1600 logs and 16,600,000 curve feet of data. For quick reference to a given log, the summary listing has been indexed into seven divisions: well classification, location by county or parish, curve type, log type, operators, location by state, and well names. These indexes are arranged alphabetically and cross-referenced by page number.

950. GGIS-100374/O/ / /A/ / / / /

Title- Summary of Recent FLOSCAL/EQUILIB Simulations of Scaling and Corrosion in Geothermal Systems

(3rd Session -- EPRI Progress Reports)

Author(s)- / Lessor , D. L. / Kreid , D. K. / Cheatham , R. L. /

Conference- 3rd Annual Geothermal Conference and Workshop Proceedings

Monterrey

California

USA (June 26 , 1979)

Publisher- Electric Power Research Institute

Palo Alto, California

Publication date- October 1979

Pagination- Page 15 , 7 Pages

Report/patent- EPRI-WS-79-166

Local Availability- CES

Corporate Author- Battelle Pacific Northwest Labs.

Richland , Washington , USA

Auxiliary expression(s)-

Illus. / Graph (4) / Diagram (1) /

Table

Ref.

Descriptor(s)- / Case histories / Chemical composition / Computer codes / Corrosion / Geothermal brines / Geothermal power plants / Scaling / Testing /

Abstract by Author

A research program is currently in progress wherein the family of geothermal scaling codes (EQUILIB, FLOSCAL, PLANT, GEOSCALE) is being applied to simulate scaling and corrosion in actual geothermal facilities. FLOSCAL/EQUILIB simulations will be performed for all selected cases using prototypic brine data and flow/process specifications. Simulations of power plant performance degradation due to the effects of scale and corrosion will also be performed for some of the cases using the entire family of codes. The objective of this paper is to summarize the results of simulations completed or in progress. Case evaluations planned for review include results of simulations of the Heber 2000 hr heat exchange tests, simulation of flashing well tests, and preliminary plans for simulations of

the PSEMT. A brief discussion is also provided for other cases that have tentatively been identified for evaluation.

951. GGIS-100332/R/ / /M/ / / / /

Title- Summary Appraisals of the Nation's Ground-Water Resources--

Subtitle- Texas-Gulf Coast Region

Author(s)- / Baker , E.T. / Wall , J.R. /

Publication date- 1976

Pagination- 30 Pages

Auxiliary expression(s)-

Illus. / Graph (3) / Map (2) /

Descriptor(s)- / Aquifers / Artificial recharge / Dissolved solids / Geopressed reservoirs / Ground subsidence / Ground water / Gulf Coast / Injection wells / Texas / Water resources / Water table /

Abstract by Enviroline

Groundwater in the Texas Gulf region is a large and important resource that can provide a more significant percentage of the area's total water supply. Total water requirements within the region are expected to rise sharply from 14 million acre-FT. (17 CU. KM.) in 1970 to nearly 26 million acre-FT. (32 CU. KM.) in 2020. About half of the water used in 1970 was groundwater. Information on the importance of subsurface reservoirs in water development and conservation plans in the Texas Gulf region is provided. The advantage of considering the ground and surface water subsystems as closely related and equal parts of the entire water supply system is stressed. The potential for obtaining electrical energy and freshwater from geopressed reservoirs and constraints on the development of groundwater resources, including water rights and technological obstacles, are examined.

952. GGIS-100411/O/ / 1/A/ / / / /

Title- Summation and Future Projections

(Panel Discussion)

Author(s)- / Woodson , Herbert H. / Bernea , Joseph / Bel , Clyde F., JR / Lombard , David / Repper , Fred C. / Suter , Hans /

Conference- 2nd Geopressed Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 335 , 28 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Descriptor(s)- / Geothermal energy / Geo brine / Research programs / U.S. Energy Research and Development Administration /

Abstract by Energyline

A summation of issues discussed at a conference on the development of thermal energy from geopressed zones,

including future projections is presented. Speakers included Joseph Barnea, U. N. Inst. for Training and Research; Louisiana State Rep. Clyde F. Bel, Jr.; David Lombard, ERDA; Fred C. Repper, Central Power and Light Co.; Hans Suter, Environmental Consultant; and Herbert H. Woodson, Univ. of Texas.

953. GGIS-100168/J/ / /A/ / / / /

Title- Superpressured, Superhot and Bubbling with Gas
(Gulf Coast Geopressured, Geothermal Formations Hold
Three-in-One Energy Source)

Publisher- Houston Chamber of Commerce
Houston, Texas

Journal- Houston

Publication date- Vol. 49 , Issue 4 , May 1978

Pagination- Page 14 , 6 Pages

Local Availability- CES

Auxiliary expression(s)-

Illus. / Map (1) / Photo (1) /

Descriptor(s)- / Brazoria County / Corrosion / Economics /
Forecasting / Geopressure resources / Gulf Coast / Methane /
Offshore sites / Ownership / Research programs / Resource
assessment / Resource development / Environmental effects /

Abstract by GGIS

Beneath the Gulf Coast lies what may be an important new source of energy-- methane gas dissolved in very hot salt water under very high pressure. Whether this resource can be used in the near future depends upon the success of current research. The U.S. DOE is funding studies to locate likely onshore geopressured geothermal zones and learn how to exploit them. The world's first well drilled specifically for geopressured methane will be located in Brazoria County, Texas. Existing wells in potentially geopressured areas are being tested to obtain reservoir production data necessary to access the energy potential of dissolved gas and heat within Gulf Coast aquifers. Commercialization, ownership, environmental concerns, corrosion problems, and economic factors in geopressure development are also discussed.

954. GGIS-100176/O/ / /A/ / / / /

Title- Supply of Natural Gas From Geopressured Zones

Subtitle- Engineering and Costs

Author(s)- / Dorfman , M. H. /

Conference- Unitar Conference on Energy and the Future
Laxenburg, Austria (July 5 , 1976)

Publisher- Pergamon Press, Inc.
Elmsford, N. Y.

Publication date- 1977

Pagination- Page 873 , 16 Pages

Report/patent- CONF--760763

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Cenozoic Era / Geological setting / Geology / Geopressured zones / Gulf Coast / Hydrology / Methane / Natural gas / Power generation / Technology assessment / Coastal regions / Cost / Economics / Engineering / Exploitation / Geological surveys / Geopressured systems / Gulf of Mexico / Natural gas deposits / USA /

Abstract by DOE/RECON

Research on deposits of methane (swamp gas, shale gas, gas occluded in coal, and other unusual occurrences) has been initiated, particularly sources contained in solution in waters of geopressured zones of the U. S. Gulf Coast Basin. A major research effort has been underway for 3 years to evaluate the geologic and hydrologic regimes of this basin and the utilization technology for production of electricity and concomitant extraction of methane. This analysis, although confined to the U. S. Gulf Coast Basin, may serve as a model for similar basins known to exist worldwide, wherever predominantly clastic sediments have been rapidly deposited in Cenozoic time.

955. GGIS-100163/R/ / /A/ / / / /

Title- Surface Disposal System for Geothermal Fluids

Author(s)- / Rios-Castellon , Lorenzo Alberto /

Publication date- December 1976

Pagination- 176 Pages

Corporate Author- Texas University, Austin
Austin , Texas , USA

Auxiliary expression(s)-

Illus. / Diagram (16) / Graph (14) / Map (5) /

Ref.

Table

Descriptor(s)- / Cooling ponds / Environmental effects / Flashed steam systems / Fluid flow / Geopressure power plants / Geothermal brines / Gulf Coast / Gulf of Mexico / Heat flow / Heat transfer / Numerical solution / Pipelines / Working fluids / Surface disposal / Texas / Thermal diffusion /

Abstract by Author (revised)

This report presents information about the surface disposal of geothermal effluent brines, especially about the disposal of geothermal effluent from the potential geopressured geothermal energy utilization facilities along the Texas Gulf Coast. An effort has been made to cover the subject thoroughly, including the environmental description of the area involved -- the Texas Gulf Coast and Gulf of Mexico -- and the physical description of a potential surface disposal system. The descriptions and technical calculations contained in the report are presented as guides for the preliminary conceptual design of a geothermal waste surface disposal system that could be used in the Texas Gulf Coast geopressured geothermal energy development project.

956. GGIS-100393/O/ / /A/ / / / /

Title- Surface Facilities for Resource Evaluation Studies at Pleasant Bayou Test Well Site

Geopressured Geothermal Bibliography

Author(s)- / Stevens , John E. / Lamb , J. Parker /
Publisher- 4th Geopressured Geothermal Energy Conference
Publication date- Vol. 2 , June 1980
Pagination- Page 835 , 8 Pages
Available- Center for Energy Studies

University of Texas at Austin

ENS

Austin

TX

78712

(Paper copy)

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (1) /

Descriptor(s)- / Disposal wells / Geopressured wells / Geothermal
power plants / Pleasant Bayou No. 1 Well / Pleasant Bayou No. 2
Well / Production testing / Resource assessment / Surface
equipment / Test facilities / Texas /

Abstract by Author

First stage construction of surface facilities will include only a relatively small amount of equipment, primarily a wellhead choke and high-pressure gas separator. Brine pressure will be maintained at 1,000 psia downstream of the separator so that no additional pumping will be required for reinjection (into Pleasant Bayou No. 1 Well). Extensive instrumentation will be installed to determine pressures, temperatures, gas content, water chemistry, and corrosion characteristics. After analysis of data from the initial production tests, a decision will be made on specific facilities required for the long-term test program. It is anticipated, for example, that an additional gas separator (low pressure) will be installed along with fan-type brine coolers and a system of tanks for water clarification. Also required will be a battery of high pressure pumps for reinjecting the spent brine and a gas processing unit for delivering pipeline quality methane.

957. GGIS-100411/O/ / 1/A/ // //

Title- Surface Technology and Resource Utilization
(4th Session)

Author(s)- / Underhill , Gary K. /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 231 , 73 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

958. GGIS-100409/R/ / /M/ // //

Title- Systems Analysis of the Texas Gulf Coast Geopressured Resources

Author(s)- / Zinn , C. Dale /

Publication date- July 1979

Pagination- 33 Pages

Available- Texas State Library

1201 Brazos

Austin

TX

Local Availability- GGIS

Corporate Author- Texas Energy Advisory Council

Austin , USA

Descriptor(s)- / Commercialization / Computer codes / Flow rate / Frio formation / Geopressure resources / Geothermal resources / Gulf Coast / Industry / Legal aspects / Methane / Physical properties / Planning / Production rate / Regulations / Resource development / Texas / Wilcox formation /

Abstract by Author (rev.)

The work performed by the Geothermal Group within the Center for Energy Studies on the Texas Energy Advisory Council (TEAC) funded portion of the development planning scenario for the Gulf Coast Geothermal/Geopressured Resource is described in this report. An integral part of formulating a development strategy was the determination of the prospective users of the resource. In addition, the issues concerning the resources as related to the users had to be identified, as did any possible alternate methods for the commercial development of the resource.

959. GGIS-100452/R/ / /M/ / / / /

Title- SIMIR/6--A Two Dimensional Steady State and Transient Heat Conduction Code for Use on an IBM 360/75 Computer--A User's Guide

Author(s)- / Kraus , H.G. /

Publication date- April 1977

Pagination- 316 Pages

Report/patent- TREE-1127

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Energy Research and Development Administration,
Washington, D.C. (USA). Div. of Geothermal Energy

EY-76-C-07-1570

Sponsor- / Energy Research and Development Administration, Idaho
Falls, ID (USA). Idaho Operations Office

EY-76-C-07-1570 /

Corporate Author- EG and G Idaho, Inc.

Idaho Falls , USA

Corporate Author- Idaho National Engineering Lab.

Idaho Falls , USA

Auxiliary expression(s)-

Illus. / Diagram (6) / Figure (6) / Graph (30) /

Table

Ref.

Descriptor(s)- / Computer calculations / Computer codes /
Computerized simulations / Convection / Data processing / Heat
transfer / Isothermal maps / Temperature dependence /
Temperature distribution / Temperature gradients / Thermodynamic
properties / Time dependence /

Abstract by Author

The two-dimensional heat conduction code, SIMIR/4, has provided the basis to create the new and only documented version of this code, SIMIR/6. Although the numerical technique, upon which all versions of SIMIR have been based, is briefly presented, this report is centered around and dedicated to the user. Many minor changes have been made to the code including simplification of the form of some data that is transferred between the user supplied Subroutine SUBR and the main program. Isothermal contour plotting capability and the moment generating equivalent linear temperature distribution routines are built into SIMIR/6. The latter routines make it possible to generate thermal gradient information for support of thermal stress analyses in accordance with Subsection NB-3653 of the ASME Section III code for application of the thermal stress pipe equations. Uniform temperature initialization of the conducting regions of a model is now possible. Additional input data forms have been abandoned. SIMIR/6 can handle up to a 100 * 100 mesh array in 2D cartesian (x-y) or cylindrical (r-z) coordinates with up to 100 different materials in any given thermal model. The materials may represent conducting or convecting regions. Convection materials may be on internal or external surfaces of conducting materials. This report includes a detailed presentation of SIMIR/6 input and output data with four examples illustrating the various options of the code. Convergence accuracy and stability characteristics are studied.

960. GGIS-100407/O/ / /A/ / / / /

Title- SMUDGE #1

Subtitle- Economic Impacts on Geothermal Power Plant Design

Author(s)- / Tucker, Robert E. / Kleinhans, Paul V. / Keilman, L. R. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9, 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4, 1980

Pagination- Page 533, 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasei W. Roberts

Available- Geothermal Resources Council

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95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (1) /
Table
Ref.

Descriptor(s)- / California / Comparative evaluations / Cost / Design
/ Economic analysis / Efficiency / Geothermal power plants /
Geysers Geothermal Field / Performance / Planning /
Specifications / Steam power plants / Steam turbine power
generation / Steam turbines / Trade / Vapor dominated systems /
Abstract by GGIS

SMUDGE #1 is the geothermal power plant being designed and installed for the Sacramento Municipal Utility District. This plant operation will differ from others in the Geysers area in that SMUD plans to purchase steam on a "per pound" basis. In the existing plants, steam is purchased on a "net generation" basis; the charge is based solely on the amount of power that leaves the plant site. The "per pound" purchasing method recognizes all costs associated with steam use for production. Clearly, under the "per pound" pricing method, plant efficiency assumes a new importance, as does the minimization of use of any incremental and auxiliary power. To combat plant inefficiencies, the design of SMUDGE #1 includes a more efficient turbine, and calls for the purchase of a larger heat rejection system. The design considerations which will lead to increased plant efficiency are discussed in this paper.

961. GGIS-100258/0/ / /M/ / / / /

Title- SPWLA 16th Annual Meeting Logging Symposium
Conference- SPWLA Annual Logging Symposium
New Orleans
Louisiana
USA (June 4 , 1975)
Publication date- Vol. 16 , 1975

962. GGIS-100190/ / / /A/ / / / /

Title- Tapping the Main Stream of Geothermal Energy
Publication date- Vol. 5 , Issue 4 , May 1980
Pagination- Page 6 , 10 Pages
Local Availability- GGIS
Auxiliary expression(s)-

Illus. / Diagram (1) / Map (1) / Photo (3) /
Descriptor(s)- / Binary cycle power generation / Cost / Energy
consumption / Energy source development / Energy supplies /
Environmental effects / Flashing / Geopressured reservoirs /
Geopressured systems / Geothermal resources / Geysers Geothermal
Field / Gulf Coast / Heber Geothermal Field / Hydrothermal
systems / Power potential /

Abstract by FC

The extent and possibilities for geothermal resource development, including geopressured geothermal resources are discussed. A representative list of U.S. geothermal projects is presented and the practical considerations of technology and cost of ongoing projects are discussed.

963. GGIS-100407/O/ / /A/ / / / /

Title- Target Industries for Geothermal Direct Heat Applications

Author(s)- / Meyer , Richard T. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 589 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Direct energy utilization / Economics / Energy consumption / Energy demand / Geothermal energy / Industrial heating / Industry / Market / Process heat / Steam /

Abstract by GGIS

The objective of this work is to identify industries that could use geothermal direct heat applications. Energy consumption data has been compiled for 455 mining and manufacturing industries. The criteria used for screening and selecting the prospective industries include: 1) that the maximum process heat temperature requirement be no more than 400 deg C; 2) that the percent of total process heat utilized be at least 20%; 3) that the total national process heat consumed by a given industry be a minimum of 5×10^{12} btus/yr.; and 4) that the energy use intensity, or the energy consumed per establishment, be such that one establishment would consume 50% of the energy output capability of one well, or that each of several establishments (an industrial park) would consume 10% of the output.

964. GGIS-100407/O/ / /A/ / / / /

Title- Technical and Economic Assistance of Geopressured Energy Recovery and Conversion

Author(s)- / Fick , Theodore R. / Hankin , Jerome W. / Renton , Alexander / Swanson , Robert K. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
 Davis, CA
 Publication date- Vol. 4, 1980
 Pagination- Page 711, 4 Pages
 Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasei W. Roberts
 Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 CA
 95616
 Local Availability- GGIS
 Sponsor- / Electric Power Research Inst., Palo Alto, CA (USA)
 Project no. RP-1272 /
 Auxiliary expression(s)-
 Illus. / Diagram (1) / Graph (1) /
 Table
 Ref.
 Descriptor(s)- / Brines / Cost / Design / Dissolved gases / Economic
 analysis / Economics / Elevated temperature / Exploitation /
 Feasibility studies / Geopressure resources / Geopressured
 reservoirs / Geopressured zones / Geothermal fluids / Gulf of
 Mexico / Louisiana / Methane / Planning / Sandstone / Sediment
 deposits / Technology assessment / Texas /
 Abstract by GGIS

Information about twenty prospective onshore geopressured
 geothermal reservoir sites in Texas and Louisiana is used to
 summarize the economics and technology of geopressured energy
 extraction. These sites contain hot, pressurized sediments with
 energy potential in the form of hot, saline brine with near
 saturation quantities of methane (recovered as methane rich
 natural gas). It is estimated that these resources have an
 energy equivalent of 232 TCF of dissolved methane and 367 quads
 of thermal energy.

 965. GGIS-100004/0/ / /A/ / / / /

**Title- Technical Assessment of the Impact of Geopressure Development
 in the Corpus Christi Area of Texas**

Author(s)- / Kleeman, W. Tom / Haynes, Kingsley E. / Freeland,
 Thomas F. /

Conference- Development and Utilization of Geothermal Resources

Publication date- Vol. 1, May 29, 1975

Pagination- Page 2389, 13 Pages

Available- Superintendent of Documents

U.S. Government Printing Office

Washington, D.C.

20402

USA

Local Availability- CES

Descriptor(s)- / Geopressured systems / Economics / Environmental
 effects / Forecasting / Texas / Maps / Tables / Diagrams / Well
 head temperatures / Well head pressure / Depths / Power
 generation / Capital / Cost / Statistical analysis / Land use /
 Theoretical treatments /

Abstract by GGIS

Geopressured Geothermal Bibliography

Geothermal development in the Corpus Christi region of Texas has distinct possibilities due to a belt of geopressured sands in the immediate off-shore area. An examination, based on a localized version of the Texas Input-Output Model and on information from the environmental policy impact analysis, is conducted of the economic interrelationships between the development of a nearby geothermal energy source and alternative environmental policies.

966. GGIS-100054/J/ / /A/ / / / /

Title- Technical Note

Subtitle- Some Practical Aspects of Log Interpretation of Gas-bearing Formations

Author(s)- / Banthia, B.S. /

Publication date- Vol. 18, Issue 2, March 1977

Pagination- Page 39, 3 Pages

Corporate Author- Terra Mar Consult

Dallas, Texas, USA

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Density / Gamma ray logging / Geopressured zones / Induction logging / Neutron logging / Porosity / Resistivity surveys / Shale / Sonic logging / Water saturation /

Abstract by Compendex

Due to geopressured mechanisms along with shaliness, resistivity is reduced but the apparent porosity as indicated from the acoustic and neutron logs is increased. As a result of these self-compensating factors, the log analysis based on acoustic, neutron, gamma-ray and induction logs shows reliable water saturations but somewhat higher porosities. The density-induction log combination, on the other hand, gives realistic porosities but somewhat higher water saturations.

967. GGIS-100240/J/ / /A/ / / / /

Title- Technical Overview of Geothermal Resources

Author(s)- / Austin, Carl F. /

Journal- Land Water Law Review

Publication date- Vol. 13, Issue 1, 1977

Pagination- Page 9, 16 Pages

Auxiliary expression(s)-

Illus. / Diagram (8) /

Ref.

Descriptor(s)- / Exploitation / Geologic processes / Geothermal resources /

Abstract by EIC

Geological processes that provide heat and accumulate it within the crust of the earth into a localized concentrated deposit are described. Key variables that determine the exploitability of a given geothermal occurrence are discussed. While the problems of finding and producing geothermal energy should not be glossed over, the opportunities are tremendous.

968. GGIS-100025/ / / 7537/A/ / / / /

Title- Techniques for Gravel Packing Abnormally Pressured Unconsolidated Reservoirs

Author(s)- / Szescila , A. J. /

Publisher- ASME

Journal- American Society of Mechanical Engineers (Papers)

Publication date- 1975

Descriptor(s)- / Oil well production / Fluid flow / Oil wells / Bottom hole pressure / Petroleum reservoir engineering / Slurry packing /

Abstract by NTIS

Recent improvements in down hole completion tools and fluids, along with improvements in gravel packing methods have made it possible to pack off and subsequently produce unmanageable geopressured zones. The techniques are field proven for both upper and lower zone packs and are compatible with any currently used carrying agent or workover fluid. The basic tool alignment would only require minor modifications of the conventional crossover tool assembly. The entire system has successfully functioned in fluids weighing 17.8 PPG.

969. GGIS-100446/R/ / / /M/ / / / /

Title- Technology Assessment of Geothermal Pumping Equipment

Subtitle- Final Report, July 1978

Author(s)- / Nichols , Kenneth E. / Malgieri , Anthony J. /

Publication date- September 1978

Pagination- 88 Pages

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy
EG-77-C-04-4162 /

Corporate Author- Barber-Nichols Engineering Co.

Arvada , CO , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Map (2) / Photo (9) /

Table

Ref.

Descriptor(s)- / Artificial recharge / Binary cycle power generation / Downhole pumps / Efficiency / Geothermal brines / Heat exchangers / Pumping / Pumps / Technology assessment /

Abstract by GGIS

About 30 interviews were conducted in an effort to assess the current state of geothermal pumping technology, the kind of pump testing already done, and the problems remaining. The greatest problems are associated with downhole pumps. Downhole pumps can offer great economic benefits, but current standard designs have not proved reliable at geothermal depths and temperatures. Continued economic incentives for manufacturers should result in development of a commercially useful downhole pump during the

next 12 months. Brine reinjection pumps have yet to be tested in the size range required for commercial plants. No field experience has yet been identified with brine transport pumps to deliver single phase liquid at downhole temperature from the wellhead to the plant site. While no problems are expected in adopting light hydrocarbon lubricant pumps already used in refineries to the much higher output required in geothermal plants, no such pumping system has yet been tested. Direct contact heat exchangers require pumps which will vent entrained gases and remove the resulting precipitates. Efficiencies of all brine and light hydrocarbon pumping equipment should be at least 70%; if certain improvements are made in materials, an efficiency of 80% should be possible.

970. GGIS-100004/0/ / /A/ / / / /

Title- Technology Forecast in United States Geothermal Energy Resource Development

Author(s)- / Maslan , Frank / Gordon , Theodore J. / Stover , John /

Conference- Development and Utilization of Geothermal Resources

Publication date- Vol. 1 , May 29 , 1975

Pagination- Page 2409 , 11 Pages

Available- Superintendent of Documents

U.S. Government Printing Office

Washington, D.C.

20402

USA

Local Availability- CES

Corporate Author- The Futures Group

124 Hebron Avenue , Glastonbury , Connecticut , 06033 , USA

Descriptor(s)- / USA / Tables / Diagrams / Forecasting / Power generation / Hot dry rock systems / Vapor dominated systems / Geopressured systems / Hot water systems / Energy reserves / Economics / Statistical model / Cost /

Abstract by GGIS

This forecast identifies the nature of the technology necessary for industrializing U. S. geothermal energy resources, means for overcoming impediments to it, and its range of energy production levels. First, a two-step interrogation was conducted which constructed a 6-level industrial relevance tree followed by specially designed interviews with scientific and industrial authorities. Results of geothermal electric capacity development under both normal and accelerated conditions are analyzed in a series of energy system diagrams. Next, an electric utility model was developed to simulate real geothermal electric capacity and project geothermal energy into the U.S. utility fuel mix. Incorporated into the model are economics, construction time, reliability, fuel availability, environmental factors, and technology.

971. GGIS-100004/0/ / /A/ / / / /

Title- Tectonic and Hydrologic Control of the Nature and Distribution of Geothermal Resources

Author(s)- / Muffler , L. J. R. /
 Conference- Development and Utilization of Geothermal Resources
 Publication date- Vol. 1 , May 29 , 1975
 Pagination- Page 499 , 9 Pages
 Available- Superintendent of Documents
 U.S. Government Printing Office
 Washington, D.C.
 20402
 USA

Local Availability- CES

Descriptor(s)- / Geothermal energy / Resources / Distribution /
 Control / Structural controls / Hydrologic controls / Global /
 Crust / Structure / Thermodynamic properties / Hydrologic
 properties / Heat flow / Plate tectonics / Effects / Reservoir
 rocks / Geopressure /

 972. GGIS-100039/R/ / 802/A/ / / / /

Title- Temperature and Pressure of Cenozoic Petroleum Reservoirs in Louisiana

Author(s)- / Thompson , K. F. M. /
 Publisher- Geological Society of America
 Publication date- Vol. 8 , Issue 1 , 1976
 Pagination- Page 68
 Descriptor(s)- / Louisiana / Economic geology / Petroleum / Natural
 gas / South / Gulf Coast / Continental Shelf / United States /
 Oil and gas fields / Cenozoic Era / Reservoir rocks / Temperature
 / Geopressure / Sedimentary rocks /

 973. GGIS-100004/O/ / /A/ / / / /

Title- Temperature Pressure Relations in Shallow Parts of Thermal Areas of Yellowstone National Park, Wyoming

Author(s)- / White , D. E. / Fournier , R. O. / Muffler , L. J. P. /
 Truesdell , A. H. /
 Conference- Development and Utilization of Geothermal Resources
 Publication date- 1975
 Descriptor(s)- / Wyoming / Economic geology / Geothermal energy /
 Yellowstone National Park / United States / Exploration / Ground
 water / Geopressure / Relation / Temperature / Self-sealing /
 Aquifers / Drilling / Fluid flow / Permeability / Porosity /
 Pressure buildup /

 974. GGIS-100434/R/ / /M/ / / / /

**Title- Test and Evaluation of a Geothermal Heat Exchanger
 (Research Project 376: Final Report)**

Subtitle- AT Heber, California
 Author(s)- / Lombard , G. L. /
 Publication date- September 1975
 Pagination- 64 Pages
 Report/patent- EPRI-376

Geopressured Geothermal Bibliography

Available- Electric Power Research Inst.

3412 Hillview Ave.

Palo Alto

CA

94304

(Paper copy)

Local Availability- CES

Sponsor- / Electric Power Research Inst., Palo Alto, CA (USA) /

Corporate Author- San Diego Gas and Electric Co.

CA , USA

Auxiliary expression(s)-

Illus. / Diagram (4) / Photo (19) / Graph (25) /
Table

Descriptor(s)- / Carbon steels / Copper / Corrosion / Corrosion
resistant alloys / Cost / Descaling / Evaluation / Flow rate /
Geothermal brines / Heat exchangers / Heat transfer / Nickel /
Scale composition / Scaling / Temperature / Testing / Titanium /

Abstract by Author (rev.)

A small-scale, tube-in-shell heat exchanger with four sections in series was tested with geothermal brine. The brine inlet temperature was approximately 355 deg F and contained 14,500 ppm dissolved solids. Scale was deposited on the heat exchanger tubes as heat was extracted from the brine and caused the overall heat transfer coefficient to decrease with time. Three tube materials commonly used in heat exchangers were tested. These materials were titanium, carbon steel, and 90% copper-10% nickel. No corrosion was observed on the titanium tubes after 560 hours of testing. The carbon steel tubes sustained slight pitting and decarburization during 560 hours exposure to the geothermal brine. Some corrosion of the copper-nickel tubes was evident after exposure for 200 hours. The copper-nickel tubes corroded at a much more rapid rate than the carbon steel. The tests were conducted with brine flow rates of 5, 10, and 20 ft/sec in the heat exchanger tubes. As the brine velocity was increased from 5 to 20 ft/sec, the rate of decline in the heat transfer coefficient increased, indicating that scale deposition is a function of brine velocity as well as heat transfer. The test results indicate that the heat exchanger system will perform best at a brine velocity of 5 to 7 ft/sec. This velocity range is commonly accepted by industry for tube-side velocities in conventional heat exchanger designs. The test results indicate that the scaling rate is primarily a function of brine velocity and tube material type, with some effects of temperature becoming apparent as the temperature approaches 150 deg F. These results seem to show that the minimum brine exit temperature should be kept at 150 deg F or higher and that the maximum practical brine velocity may be around 7 ft/sec in full-scale heat exchanger designs. Chemical cleaning with a 50% caustic solution at 80 deg F effectively removed the scale layer that had developed on tube surfaces after continuous exposure to the brine for 560 hours, but it may cause some degradation of mild carbon steel tubes. Where steel tubes are used, an acid cleaning-solution would be more appropriate.

975. GGIS-100451/R/ / /M/ / / / /

Title- Test Facility for Well Logging Cables

Subtitle- (In Air at Atmospheric Pressure)

Publication date- February 1, 1977

Pagination- 17 Pages

Report/patent- SAN/1208-1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Energy Research and Development Administration,
Washington, D.C. (USA). Div. of Geothermal Energy
EY-76-C-03-1208 /Corporate Author- Systems, Science and Software
La Jolla, CA, USA

Auxiliary expression(s)-

Illus. / Diagram (3) /

Descriptor(s)- / Electrical conductivity / Electrical properties /
High temperature / Laboratory testing / Materials testing /
Stresses / Well logging equipment /

Abstract by Author

A system has been built to test, in air at ambient pressure, short sections of electromechanical cables which are potentially useful for geothermal well logging service. Electrical characteristics of the test cable are monitored while the cable is exposed to elevated temperature and tensioned in a manner simulating loading experienced by a typical well logging cable. Cable conductor resistance, dielectric resistance and capacitance are measured. The cable can be exposed to bending, simulating that which occurs when passing over sheaves or wound on or off a drum. Cable anchors are arranged to permit nearly 100% strength tensioning in the heated section. Electrical connectors are made at the unstrained ends at ambient temperature. The system can also be used to tension test cable terminations at elevated temperatures.

976. GGIS-100528/O/ / /A/ / / / /**Title- Test Prognosis and Actual Test Performance of the Pleasant Bayou No. 2 Well**

Author(s)- / Hartsock, James H. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 91, 5 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)
SC-PB-80374 /

Auxiliary expression(s)-

Illus. / Graph (4) /
TableDescriptor(s)- / Brazoria County / Flow rates / Fluid flow / Gulf Coast / Natural gas / Permeability / Pleasant Bayou No. 2 Well /
Reservoir pressure / Texas / Well leasing /

Abstract by Author

Phase I testing on the DOE-GCO Pleasant Bayou No. 2 geopressured-geothermal well, Brazoria County, Texas, was completed without major operational problems. All objectives of the test were accomplished. Initial static reservoir pressure was 11,170 psia and reservoir temperature was 309 deg F (153.3 deg C). A maximum flow rate of 19,200 B/D was achieved but was reduced to 15,324 B/D when injection-well pressure rose. Analysis of buildup data indicate an effective permeability of 153 md for the geopressured-geothermal aquifer, with reductions in transmissibility at 1,650 and 9,020 ft from the well. The average natural gas content of the brine, measured at separator conditions, was 22.35 scf/bbl.

977. GGIS-100895/ / / /A/ / / / /

Title- Test Site for Geopressured Geothermal Well

Subtitle- Frio Sandstone, Texas Gulf Coast

Author(s)- / Bebout , D.G. / Loucks , R.G. / Gregory , A.R. /

Conference- AAPG--Sepm Annual Convention

Washington

DC

USA (June 12 , 1977)

Publication date- Vol. 61 , Issue 5 , May 1977

Pagination- Page 765

Descriptor(s)- / Austin bayou / Brazoria county / Frio Formation / Galveston county / Geopressured reservoirs / Geopressured systems / Geopressured wells / Geothermal exploration / Gulf coast / Permeability / Sand / Site selection / Temperature measurement / Texas /

Abstract by DOE/Recon

A geopressured geothermal reservoir should have a sand volume of 3 CU MI (4.8 CU KM), 50 SQ MI (130 SQ KM) in area and 300 FT (90 M) thick, subsurface fluid temperature of 300/ sup O/F (150/sup O/C), and permeability of at least 20 MD. Data available suggest that the water will be saturated with methane. Regional and detailed studies of the Frio formation along the Texas Gulf Coast were completed to develop such a prospect. In Hidalgo, Kenedy, Nueces, Matagorda, Brazoria, and Galveston Counties, several large fairways were identified which have sufficient sand thickness and fluid temperatures to be prospective. However, optimum permeability in sand bodies deeper than 12,000 FT (3,600 M) is present in the quartz-rich sands of the Brazoria-Galveston County fairway. For this reason, more detailed work has centered on this area, and the Austin Bayou prospect was identified. The Austin Bayou prospect has maximum dimensions of 10 by 25 MI (16 by 40 KM) but sands cumulate to 1,200 FT (360 M) and temperatures are as high as 320/SUP O/F (160/SUP O/C). The Austin Bayou prospect meets all of the geologic requirements for a geopressured geothermal reservoir. Barring environmental and legal problems, it is anticipated that a test well will be drilled in this area to evaluate further this potential alternate source of energy.

978. GGIS-100089/B/ / /M/ / / / /

Title- Testing and Sampling Procedures for Geothermal-Geopressed Wells

(Final Report: 1. Task of 1. Part "Special Projects Reserach for Petroleum Engineering Aspects of Geothermal Research")

Author(s)- / Boyd , W. E. / Dorfman , M. H. / Podio , A. L. /

Publisher- University of Texas at Austin, Center for Energy Studies

Pagination- 152 Pages

Available- Center for Energy Studies

Center for Energy Studies

Engineering Science Bldg. 143

The University of Texas at Austin

Austin, Texas 78712

Sponsor- / ERDA

E-(40-1)-5243 /

Corporate Author- Texas Univ.

Center for Energy Studies

Austin , Texas , USA

Auxiliary expression(s)-

Illus. / Figure (54) /

Abstract by Author

Test wells to tap and sample geothermal-geopressed formations at 15,000-20,000 feet in the Gulf Coast area can be drilled routinely utilizing available equipment and methods. Electrical logs, surveys and fluid samplers can be used to obtain accurate and reliable information as to depths, temperatures, pressures, and fluid content of the geopressed formations before the well is completed. But it will be necessary to set casing and flow the well, at least temporarily to secure fluid production volume and pressure data to evaluate the producibility of the geopressed resource. Electric logging and wireline survey methods are fully developed techniques for measuring the parameters needed to assess a geopressed zone before setting casing. Formation subsidence, though it may be slow to develop can be measured using radioactivity tracer surveys.

979. GGIS-100528/O/ / /A/ / / / /

Title- Testing of Six "Wells of Opportunity" During 1980 and 1981

Author(s)- / Klauzinski , Richard Z. /

Conference- Fifth Conference on Geopressed-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 171 , 6 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy

DE-AC08-80ET27081 /

Auxiliary expression(s)-

Illus. / Diagram (5) /

Table

Geopressured Geothermal Bibliography

Ref.

Descriptor(s)- / Experimental results / Louisiana / Testing / Texas /
US DOE / Wells of opportunity /

Abstract by Author

This paper summarizes the testing of six "Wells of Opportunity" in different geologic environments in Texas and Louisiana by Eaton Operating Company for the U.S. Department of Energy. The results were encouraging. Natural gas-to-brine content ranged from 33.0 to 55.0 SCF/bbl. Gas production rates ranged from 93 to 600 MCFD. Sustained water production rates ranged from 1,950 to 15,000 BWPD. Bottom-hole temperatures ranged from 260 to 327 deg F. Reservoir pressures ranged from 6,627 psia to 13,203 psia. A test near Beaumont resulted in discovery of oil and gas.

980. GGIS-100558/R/ / /M/ / / / /

**Title- Testing Geopressured Geothermal Reservoirs in Existing Wells
(Final Report)**

Subtitle- Pauline Kraft Well No. 1, Nueces County, Texas

Publication date- 1981

Pagination- 147 Pages

Report/patent- DOE/ET/27081-4

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80ET27081 /

Corporate Author- Eaton Operating Co., Inc.

Houston, TX, USA

Descriptor(s)- / Failures / Geopressured reservoirs / Nueces County /
Pauline Kraft Well No. 1 / Production / Reentry / Testing / Texas /

Abstract by NTIS

The Pauline Kraft Well No. 1 was originally drilled to a depth of 13,001 feet and abandoned as a dry hole. The well was re-entered in an effort to obtain a source of GEO exp 2 energy for a proposed gasohol manufacturing plant. The well was tested through a 5-inch by 2-3/8 inch annulus. The geological section tested was the Frio-Anderson sand of Mid-Oligocene age. The interval tested was from 12,750 to 12,860 feet. A saltwater disposal well was drilled on the site and completed in a Miocene sand section. The disposal interval was perforated from 4710 to 4770 feet and from 4500 to 4542 feet. The test well failed to produce water at substantial rates. Initial production was 34 BWPD. A large acid stimulation treatment increased productivity to 132 BWPD, which was still far from an acceptable rate. During the acid treatment, a failure of the 5-inch production casing occurred. The poor production rates are attributed to a reservoir with a very low permeability and possible formation damage. The casing failure is related to increased tensile strain resulting from cooling of the casing by acid and from the high surface injection pressure. The location of the casing failure is not known at this time, but it is not at the surface. Failure as a result of a defect in a crossover joint at 723 feet is suspected.

981. GGIS-100563/R/ / /M/ / / / /

Title- Testing Geopressured Geothermal Reservoirs in Existing Wells
(Volume II. Well Test Data)

Subtitle- Final Report: Saldana Well No. 2, Zapata County, Texas

Publication date- 1981

Pagination- 282 Pages

Report/patent- DOE/ET/27081-5-v.2

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80ET27081 /

Corporate Author- Eaton Operating Co., Inc.

Houston, TX

Descriptor(s)- / Data / Geopressured reservoirs / Saldana Well No. 2 /
Texas / Well data / Well testing / Zapata County /

Abstract by NTIS

The following are included: field test data, compiled and edited raw data, time/pressure data, tentative method of testing for hydrogen sulfide in natural gas using length of stain tubes, combined sample log, report on reservoir fluids study, well test analysis, smoothing with weighted moving averages, chemical analysis procedures, scale monitoring report, sand detector strip charts, and analyses of water and gas samples.

982. GGIS-100564/R/ / /M/ / / / /

Title- Testing Geopressured Geothermal Reservoirs in Existing Wells
(Volume I. Completion and Testing)

Subtitle- Final Report: Saldana Well No. 2, Zapata County, Texas

Publication date- 1981

Pagination- 268 Pages

Report/patent- DOE/ET/27081-5-v.1

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80ET27081 /

Corporate Author- Eaton Operating Co., Inc.

Houston, TX

Descriptor(s)- / Aquifers / Geopressured reservoirs / Production /
Saldana Well No. 2 / Testing / Texas / Waste disposal / Well
testing / Wells of Opportunity / Zapata County /

Abstract by NTIS

The Saldana Well No. 2, approximately 35 miles southeast of the city of Laredo, Texas, was the sixth successful test of a geopressured geothermal aquifer under the DOE Wells of Opportunity Program. The well was tested through the annulus between 7-inch casing and 2-3/8 inch tubing. The interval tested was from 9745 to 9820 feet. The geological section was the 1st Hinnant Sand, an upper member of the Wilcox Group. Produced water was injected into the Saldana Well No. 1, which was also acquired from Riddle Oil Company and converted to a disposal well. A Miocene salt water sand was perforated from 3005 to 3100 feet for disposal. One pressure drawdown flow test and one pressure buildup test were conducted during a 10-day period. A

Geopressured Geothermal Bibliography

total of 9328 barrels of water was produced. The highest sustained flow rate was 1950 BWPD.

983. GGIS-100515/R/ / /M/ / / / /

Title- Testing Geopressured Geothermal Reservoirs in Existing Wells

Subtitle- Annual Report

Publication date- 1980

Pagination- 75 Pages

Report/patent- DOE/ET/27081-2

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80ET27081 /

Corporate Author- Eaton Industries of Houston, Inc.

TX , USA

Descriptor(s)- / Abandoned wells / Cost / Geopressured systems / Oil wells / Reentry / Testing / USA / Wells of opportunity /

Abstract by NTIS

This contract called for the acquisition and testing of Wells of Opportunity. Wells of Opportunity are located by screening published information on oil industry activity and through personal contacts with oil operators. This process resulted in recommendation of 21 candidate wells to the DOE for the WOO program. Of the 21 wells recommended, 7 were accepted. Six of these 7 were acquired for testing. Three wells have been tested, and the fourth and fifth will be tested early in 1981. Preliminary test results are briefly described and are shown in a table. The actual testing schedule and the originally proposed schedule matched very closely. Cumulative costs through November 1980 were approximately \$6.5 million and compare to an estimate of \$8.5 million for the same period. A graphical comparison of actual versus estimated costs is given.

984. GGIS-100508/R/ / /M/ / / / /

Title- Testing Geopressured Geothermal Reservoirs in Existing Wells

(Volume I: Completion and Testing)

Subtitle- Final Report: P.R. Girouard Well No. 1, Lafayette Parish, Louisiana

Publication date- January 1981

Pagination- 281 Pages

Report/patent- DOE/ET/27081-1(v.1)

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC08-80ET27081 /

Corporate Author- Eaton Operating Co., Inc.

Houston , TX

Descriptor(s)- / Geopressured systems / Lafayette Parish / Louisiana
 / P.R. Girouard Well No. 1 / Productivity / Reentry / Strata /
 Testing / Wells of opportunity /
 Abstract by NTIS

The P.R. Girouard No. 1 Well, located approximately 10 miles southeast of Lafayette, Louisiana, was the fourth successful test of a geopressured-geothermal aquifer under the Wells of Opportunity program. The well was tested through 3-1/2 inch tubing set on a packer at 14,570 feet without major problems. The geological section tested was the Oligocene Marginulina Texana No. 1 sand of upper Frio age. The interval tested was from 14,744 to 14,819 feet. Produced water was piped down a disposal well perforated from 2870 to 3000 feet in a Miocene saltwater sand. Four flow tests were conducted for sustained production rates of approximately 4000 BWPd to approximately 15,000 BWPd. The highest achieved, during a fifth short test, was 18,460 BWPd. The test equipment was capable of handling higher rates. The gas-to-water ratio was relatively uniform at approximately 40 SCF/bbl. The heating value of the gas is 970 Btu/SCF. The reservoir tests show that it is doubtful that this well would sustain production rates over 10,000 BWPd for any lengthy period from the sand zone in which it was completed. This limited flow capacity is due to the well's poor location in the reservoir and is not a result of any production deficiencies of the Marginulina Texana sand.

985. GGIS-100493/R/ / /M/ / / / /

Title- Testing Geopressured Geothermal Reservoirs in Existing Wells
 (Volume II. Well Test Data)

Subtitle- Final Report: P.R. Girouard Well No. 1, Lafayette Parish, Louisiana

Publication date- 1981

Pagination- 228 Pages

Report/patent- DOE/ET/27081-1(v.2)

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA)

AC08-80ET27081 /

Corporate Author- Eaton Operating Co., Inc.

Houston, TX

Descriptor(s)- / Abandoned wells / Data / Geopressured systems /
 Geothermal wells / Lafayette parish / Louisiana / P.R. Girouard
 Well No. 1 / Reentry / Testing /

Abstract by NTIS

The following data from the reopening of an abandoned well are presented: reservoir pressure drawdown and buildup data, Institute of Gas Technology sample log, reservoir fluid analysis, produced gas/water ratio, chemical analysis procedures, surface flow data, third party sampling and reports, sand detectors charts, and Horner-type buildup data.

986. GGIS-100998/ / / /A/ / / / /

Title- Testing Geopressured Geothermal Resource, Frio Formation, Texas Gulf Coast

Author(s)- / Bebout, D.G. / Loucks, R.G. / Gregory, A.R. /

Conference- Gulf Coast Asso. of Geological Societies 29th Annual Meeting

San Antonio

Texas

USA (October 10 , 1979)

Publication date- Vol. 63 , Issue 9 , 1979

Pagination- Page 1595 , 1 Pages

Note- Abstract only of a paper presented at the 29th annual meeting of the Gulf Coast Association of Geological Societies and the Gulf Coast Section, Society of Economic Paleontologists and Mineralogists San Antonio, Texas, October 10-12, 1979

Corporate Author- Texas Univ., Austin

Bureau of Economic Geology

Austin, Texas, USA

Descriptor(s)- / Austin Bayou Prospect / Brazoria County / Elevated temperature / Drilling / Geopressured reservoirs / Geopressured wells / Gulf Coast / Methane / Permeability / Reservoir pressure / Salinity / Sandstone / Testing / Texas / Volume / Frio formation /

Abstract by GGIS

Drilling of the first well designed to test the geopressured geothermal resource for a sustained period of time was initiated in July 1978. Regional and site-specific geologic and engineering studies supportive of this site were conducted by the University of Texas Bureau of Economic Geology and Department of Petroleum Engineering/Center for Energy Studies with funds from the U.S. Department of Energy. The area sought during these studies needed reservoir volume of 3 CU MI (12.5 CU KM), minimum permeability of 20 MD, and fluid temperatures of 300 DEG F (149 DEG C). The Brazoria fairway, Brazoria and Galveston Counties, Texas, best met these specifications and the Austin Bayou Geothermal Prospect was developed in this fairway. Funds for drilling the Nos. 1 and 2 Pleasant Bayou geothermal test wells in the Austin Bayou Prospect were provided by DOE; the operator of the wells is General Crude Oil Co. The geopressured sandstone reservoirs are in the lower part of the Frio Formation between the depths of 14,000 and 17,000 FT (4,200 and 5,100 M). The sandstone units are at the top of at least seven progradational deltaic cycles; cumulative thickness of all permeable sandstone units is 250 to 300 FT (75 to 90 M). Each deltaic cycle is composed of a gradational vertical succession characterized by low-permeability prodelta and distal delta-front sandstone and shale at the base grading to permeable distributary-mouth-bar and delta-plain sandstone and shale at the top. Fluid will be produced from No. 2 Pleasant Bayou Well, stripped of methane and heat, then injected into Miocene sandstones at 6,000 to 7,000 FT (1,800 to 2,100 M) depth in the nearby No. 1 Pleasant Bayou disposal well. The produced water is expected to have salinities ranging from 50,000 to 80,000 PPM, temperature from 300 to 350 DEG F (149 to 177 DEG C), pressure from 10,000 to 15,000 PSI (68,950 to 103,425 kPa) and 40 CU FT

(1.2 CU M) of methane per barrel. The 2-year test period will evaluate the feasibility of long-term production of large quantities of water (ultimately 40,000 BBL/day) from geopressed reservoirs.

987. GGIS-100058/J/ / /A/ / / / /

Title- Tests Set for Texas Geopressed Well

Publication date- Vol. 77 , Issue 37 , September 10 , 1979

Pagination- Page 113 , 1 Pages

Local Availability- CES

Auxiliary expression(s)-

Illus. / Photo. (1) /

Descriptor(s)- / Brazoria County / Geopressed wells / Surface equipment / Texas / Wellheads /

Abstract by GGIS

Two years of tests by the Department of Energy will measure the extent and energy potential of the Pleasant Bayou No. 2 geopressed-geothermal well in Brazoria County, Texas. To test the feasibility of producing methane and hot water from geopressed brine deposits along the Gulf of Mexico coast, gas is to be removed from the brine by pressure reduction, then reinjected into shallower deposits through one or more injection wells.

988. GGIS-100226/R/ / /M/ / / / /

Title- Texas Energy

Subtitle- Flows, Forecasts, and Policy Implications

Pagination- 53 Pages

Report/patent- NP-22996

Available- University of Houston

Houston

Texas

USA

Corporate Author- Houston University

Energy Institute

Houston , Texas , USA

Descriptor(s)- / Energy demand / Energy supply / Forecasting / Petroleum / Petroleum industry / Texas /

Abstract by TIC

This report is essentially on Texas energy supply and demand. It contains surveys of the historical and forecasted energy flows which show the complexity and magnitude of the energy problems that Texas must solve. The various sources of energy--oil, gas, coal, hydroelectric, and electrical-- are shown in multicolored fold-outs as historic flows for 1960 and 1970, and as projected flows for 1980, 1985, and a variation for 1985 assuming some significant increase in the use of Texas lignite. The five flow charts give the trends in supply and demand, the form of energy used, any conversion in use, the end use, and the amount of energy lost in the processes. The role of Texas as both a producer and consumer of energy is summarized. Texas oilmen drill more than 25 percent of the wells in the U.

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S. and produce about one-third of the oil and gas in the U. S. Texas has about 27 percent of the nation's refining capacity, and that percentage will probably increase in the next few years. Presently, more than one out of every four gallons of U.S. major oil products is made in Texas refineries. An overwhelming proportion of the nation's petrochemical industry is Texas-based: 36 percent of the carbon black, 54 percent of the propylene, 67 percent of the methanol, and 87 percent of the butadiene capacities. A large number of important industries have been drawn to Texas because of the availability of petroleum by-products for fuel and feedstocks. Energy industries--not transportation, as in most other states--account for the largest single block of energy demand. (MCW)

989. GGIS-100255/R/ / /M/ / / / /

Title- Texas Energy Outlook

Subtitle- The Next Quarter Century

Publication date- 1977

Pagination- 174 Pages

Report/patent- NP--22777

Available- Texas Governor's Energy Advisory Council

Austin

TX

Corporate Author- Texas Governor's Energy Advisory Council

Austin, Texas, USA

Descriptor(s)- / Air quality / Charges / Economics / Energy conservation / Energy policy / Energy sources / Forecasting / Government policies / Market / Natural gas / Prices / Regulations / Taxes / Texas /

Abstract by TIC

This report summarizes the first year's work of the Governor's Energy Advisory Council of Texas. Following an executive summary and an introductory chapter, Chapter 2 examines Texas energy futures, specifically forecasting alternative sources. Chapter 3 investigates alternative energy programs in three scenarios: business as usual, maximum government control, and free market. Chapter 4 includes individual policy impacts, specifically: natural gas and crude oil pricing; boiler fuel restrictions; strip-mining regulation; nuclear power restrictions; air quality standards; utility rate structures; strategic reserves of crude oil; government conservation programs; and tax structures. Following the summary chapter, additional information is given in the appendices. (MCW)

990. GGIS-100209/B/ / /M/ / / / /

Title- Texas Energy Report, Number 25

Publisher- Governor's Energy Advisory Council

Austin, TX

Publication date- 1977

Descriptor(s)- / Air pollution / Alaska / Capital / Coal / Continental Shelf / Energy conservation / Energy policy / Energy sources /

Environmental impacts / Exploration / Geological surveys /
 Geopressured systems / Geothermal energy / Lignite / Noise /
 Petroleum / Recovery processes / Reviews / Statistics /
 Technology assessment / Texas / Tools / Transportation Systems /
 Uranium /

Abstract by DOE/RECON

Geothermal energy development and utilization is discussed in general with emphasis on its capability in Texas. Transporting Alaskan crude from the point of drilling to the lower 48 is followed and the plans of Sohio to send some of the oil from California to Texas for nationwide distribution via existing pipelines owned by Southern California Gas Company and El Paso Natural Gas Company are told. An article, Coal as a Feedstock, discusses Texas' plans for future use of coal and lignite. Some new tools for uranium exploration have been tested in Texas to directly measure uranium ore grade, thus contributing to more rapid and less expensive uranium ore discovery and production. This new tool transmits lithologic and radiometric data to surface recording equipment. A new purchasing program called the experimental technology incentives program is expected to save Texas thousands of dollars in yearly operating costs and some data on state purchases are cited. An energetic energy conservation program implemented by San Antonio's transportation systems management element is reviewed. Its intent is to reduce the amount of fuel consumed by local citizens, thus improving the city's economy. The reserves of oil estimated in the U. S. OCS and legislation pertaining to this resource are summarized. Legislation and revenues dealing with OCS reserves lying off the coast of Texas are discussed. Recent information published in the Energy Policy Monitor on energy sources and much related data are briefly abstracted. (MCW)

 991. GGIS-100166/R/ / /M/ / / / /

Title- Texas Energy Resources

Subtitle- Final Draft

Publisher- National Science Foundation
 Washington, D. C.

Publication date- July 1974

Pagination- 31 Pages

Report/patent- NSF-RA-N-74-223

Corporate Author- Governor's Energy Advisory Council
 Austin, Texas, USA

Descriptor(s)- / Energy reserves / Energy sources / Geothermal
 resources / Gulf Coast / Natural gas / Rio Grande Rift / Texas /
 Trans-Pecos hot rocks / Geopressure resources /

Abstract by Geothermal Energy Update

A summary of the energy resources including lignite, coal, geothermal energy, uranium ores, and petroleum and the potentiality of solar, solid waste, and wind energy is presented. It is indicated that Texas has about 146 billion barrels of oil-in-place. As of January 1, 1973, Texas had 94.9 trillion CU FT remaining reserve of natural gas that is being used faster than new finds are made. It is estimated that Texas has over 6 billion tons of bituminous coal resources and that

Geopressured Geothermal Bibliography

there are about 20 billion tons of lignite within surface minable depths and over 100 billion tons of deep basin lignite resources. Three areas for potential geothermal resources are the Rio Grande Rift System, the Trans-Pecos hot rocks, and the Gulf Coast geothermal sands. The solid waste generation rates for agricultural and municipal-industrial sources are estimated. Generation of electrical energy from wind is of great potential in the Texas Panhandle. Texas qualifies as a potential area for the utilization of solar energy according to the isopaths of mean daily direct solar radiation. Texas has significant quantities of uranium, and more than six nuclear power plants are in the planning stage for the state. (MCW)

992. GGIS-100058/J/ / /A/ / / / /

Title- Texas Geothermal Prospect Slated to Begin Operations at Martin Ranch

Author(s)- / Bebout , D.G. / Gregory , A.R. /

Publication date- Vol. 75 , Issue 41 , October 3 , 1977

Pagination- Page 184

Descriptor(s)- / Geopressure resources / Geopressured wells / Potential energy / Test wells / Texas /

Abstract by EIC

In the Texas Austin Bayou prospect, the Anomalina bilateralis zone is composed of depositional events that consist of prodelta shale at the base, delta-front shale and sand in the middle, and delta-plain sandstone and shale at the top. Geological analysis indicates a proposed test well in the Austin Bayou prospect will drain many sandstone reservoirs in an area of approximately four sq miles. The potential electrical energy of deep (16,000 ft) geopressured geothermal reservoirs at 100 DEG F is estimated to be 49.1 x 10-11 Mw yr/lb of reservoir water in place. Based on this estimate, the total electrical energy potential of water contained by reservoirs in the Austin Bayou prospect is 1733 Mw years. Recovery factors depend on variables such as reservoir driving forces, shale water influx, and rock and fluid compressibilities.

993. GGIS-100354/J/ / /A/ / / / /

Title- Texas Geothermal/Geopressure Drilling Program Continuing in Brazoria County

Journal- Bull., Geotherm. Resour. Counc. (Davis, Calif.)

Publication date- Vol. 8 , Issue 4 , April 1979

Pagination- Page 2 , 2 Pages

Descriptor(s)- / Brazoria County / Drilling / Research programs / Texas /

Abstract by Document

General Crude, Houston, is drilling below 8500 feet at 2 Pleasant Bayou, located on a 320-acre lease in Perry & Austin Survey 2, Brazoria County, Texas. The scheduled 16,500 foot test is the company's second in a Department of Energy-sponsored Texas geothermal/geopressure program. The Texas project, according to DOE, will be ongoing with four to five wells drilled annually.

The first wells in the program will be drilled in potential geopressure areas, while later wells will explore other thermal areas.

994. GGIS-100042/J/ / /A/ / / / /

Title- The "Effective Tax Rates" of Extractive Industries and the Case for a Geothermal Resource Tax Incentive

Author(s)- / McNamara , Jack /

Publication date- Vol. 6 , Issue 6 , June 1978

Pagination- Page 11 , 8 Pages

Auxiliary expression(s)-

Ref.

Table

Descriptor(s)- / California / Economics / Environmental policy / Geopressure resources / Geothermal industry / Geysers geothermal field / Hot dry rock systems / Hot water systems / Land use / Payout / Profits / Taxes /

Abstract by Energy Info. Abstracts

A case is made for establishing a geothermal resource tax incentive. Congressional legislation extending tax breaks for intangible costs to all types of geothermal resources has been passed. However, opposition to some geothermal tax incentives is growing because of possible tax windfalls for rich investors. The geothermal industry feels that if investors were forced to pay minimal taxes on intangibles, development would suffer. Reported tax payments and profit margins of oil and gas producers are used as a model to illustrate the effects on geothermal developers of an intangibles tax and a percentage depletion deduction allowance. Two assumptions underlying the anti-tax arguments are that the percentage depletion deduction actually lowers the effective tax rate of resource companies, giving them artificially higher after-tax rates of return, and that without a federal tax, rates of return are equal among extractive industries. Using the model based on oil and gas experiences, these assumptions are nullified.

995. GGIS-100393/O/ / /A/ / / / /

Title- The Analyses of Test Results from the Fairfax Foster Sutter No. 2 Well

Author(s)- / McCoy , R. Lynn / Hartsock , James H. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1200 , 25 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Corporate Author- Gruy Federal, Inc.

Geopressured Geothermal Bibliography

Houston , TX , USA
Auxiliary expression(s)-
Illus. / Diagram (1) / Graph (3) / Map (1) / Figure (2) /
Table

Descriptor(s)- / Abandoned wells / Aquifer tests / Chemical analysis /
Data analysis / Dissolved gases / Exploratory wells / Fairfax
Foster Sutter No. 2 Well / Fluid properties / Geopressured
reservoirs / Louisiana / Moderate temperature / Pressure
gradients / Reservoir properties / Resource assessment /
Salinity / Sand / St. Mary Parish / Surface equipment / Test
facilities / Testing / Wells of opportunity /

Abstract by Author

The Fairfax Foster Sutter No. 2 Well, located in the East Franklin area of St. Mary Parish, Louisiana, is the first successful test of a geopressured-geothermal aquifer under the Well-of-Opportunity program. Gruy Federal assumed operations on March 8, 1979, when the operator, Neuhooff Oil and Gas Company, abandoned the well as a dry hole at a total depth of 16,340 feet. Agreements with the operator, landowner, and drilling contractor were executed, and the necessary permit applications were filled with the Louisiana Department of Conservation. The section tested was the MA-6 sand of lower Miocene age which has produced large quantities of gas from the adjacent but structurally separated Garden City Field. In Garden City this sand is characterized by pressure gradients of up to 0.94 psi/ft. and reservoir temperatures in the 290 DEG F (143 DEG C) range. In the subject well the observed temperature was 270 DEG F (132 DEG C) and the measured pressure gradient was 0.77 psi/ft. The net sand thickness of the tested interval was 58 ft. with an effective porosity of 19 percent. The temperature and pressure encountered were on the threshold of the limitations of the surface-recording bottomhole pressure gauge and particularly the single-conductor cables on which the gauges were run. Several gauge failures were experienced initially, probably caused by wireline malfunctions. However, these difficulties were overcome and important transient pressure data were recorded. The objectives of the tests were all accomplished, and data were obtained which will contribute to the overall assessment of the geopressured-geothermal resource of the Upper Gulf of Mexico basin. In general, the gas solubility (22.8 scf/bbl) was as expected for the temperature, pressure, and salinity of the brine. The produced water was more saline than expected (160,000 mg/l). The high concentration of dissolved solids in these waters creates a problem that will have to be addressed in future tests. The results of the analyses of the production data, along with the geological and petrophysical implications, are presented.

996. GGIS-100001/J/ / 2/A/ / / / /

Title- The Application of Trend Surface Analysis to Geothermal and
Geopressure Data on Petroleum Exploration

Author(s)- / Miller , Betty M. /

Conference- Soc. Econ. Paleontol. Mineral. Annu. Mtg.

Publisher- Am. Assoc. Petr. Geol.

Publication date- 1975
 Pagination- Page 51
 Descriptor(s)- / Utah / Economic geology / Petroleum / Uinta Basin /
 United States / Geothermal gradient / Geopressure / Trend
 surface analysis / Stratigraphic traps / Tertiary / Lower
 Tertiary /

 997. GGIS-100574/B/ / /M/ / / / /

Title- The Causes and Significance of Abnormally High-Pressured Formations

Author(s)- / Waldner, R.N. /

Publication date- 1976

Descriptor(s)- / Geopressure / Geopressured zones / High pressure /

 998. GGIS-100267/B/ / /A/ / / / /

Title- The Costs of Geothermal Energy Development

Subtitle- Final Report, January 1977

Author(s)- / Larson, Tod /

Publisher- Geothermal World Publications
 Reseda, California

Publication date- 1977

Pagination- Page 314, 23 Pages

Report/patent- PB-297 889

Available- NTIS

(Paper Copy)

(Microfiche)

Sponsor- / National Science Foundation

AER7508793 /

Corporate Author- California Univ. Riverside

Dry-Lands Research Institute

Riverside, California, USA

Auxiliary expression(s)-

Table

Illus. / Graph (1) /

Descriptor(s)- / California / Capital / Cost / Energy source
 development / Geothermal resources / Geothermal plants /
 Imperial County / Investment / Power range 100-1000 MW / Public
 utilities / Risk assessment /

Abstract by TIC

Risks and reward associated with geothermal development are summarized. Various methods for evaluating geothermal energy as an investment are discussed; factors affecting the investors' risk perceptions are described. Factors influencing the different view of risk taken by the public utilities, in contrast to that of private industry, are discussed.

 999. GGIS-100457/R/ / /M/ / / / /

Title- The Definition of Engineering Development and Research Problems Relating to the Use of Geothermal Fluids for Electric Power Generation and Nonelectric Heating

Author(s)- / Apps, J.A. /

Publication date- November 1977

Pagination- 57 Pages

Report/patent- LBL-7025

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA). Div. of Geothermal Energy

W-7405-ENG-48 /

Corporate Author- California Univ.

Lawrence Berkeley Lab.

Berkeley, USA

Auxiliary expression(s)-

Illus. / Diagram (3) /

Table

Ref.

Descriptor(s)- / Chemical properties / Direct energy utilization / Engineering / Environmental effects / Feasibility studies / Geothermal fluids / Geothermal resources / Heating / Power generation / Resource assessment / Resource development / Scaling / Thermodynamic properties / Uses /

Abstract by Author

The use of geothermal fluids for electric power generation and nonelectric purposes causes problems not normally encountered when pure water is used for similar purposes. These problems must be identified and means developed to overcome them before geothermal energy resources can become an important source of electric power or thermal energy in the United States. The purpose of this report is to list research and development projects aimed at solving those problems arising from the use of geothermal fluids from known sources in the United States. Problem areas covered are: impact on engineering design caused by chemical, thermodynamic, and transport properties of geothermal fluids; scaling and sludge formation; gases, volatile brine constituents, condensate chemistry; environmental problems. The research projects identified are general in nature and are not site specific. This report forms the basis of the organization of a national program plan. Its goal is to quicken the exploitation of domestic sources of geothermal energy. The goals of the program would be: definition of potential problems and reduction of risk; determination of the best design for any given field; reduction of capital costs for plant and ancillary equipment and the extension of plant life; improvement of plant reliability and reduction of routine maintenance; reduction of environmental problems. Secondary goals would include: effective use of waste heat; generation of revenue from geothermal fluid by-products (e.g., salt, potash, nonferrous metals, etc.) and from the production of fresh water. This report may be used to develop and implement a national plan as outlined in Section V. However, other strategies may be adopted which would lead to an equally effective outcome.

1000. GGIS-100393/O/ / /A/ / / / /

Title- The Deformation Behavior of Rocks from the Pleasant Bayou Wells

Author(s)- / Gray , Ken E. / Jogi , Pushkar N. / Morita , Nobuo / Thompson , Thomas W. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 2 , June 1980

Pagination- Page 1031 , 29 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS

Austin

TX

78712

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

DE-AC08-79-ET-27112 /

Corporate Author- Texas Univ.

Center for Earth Sciences and Engineering

Austin , USA

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (5) /

Table

Ref.

Descriptor(s)- / Compaction / Density / Drill cores / Elasticity / Fluid withdrawal / Geopressured reservoirs / Laboratory equipment / Laboratory testing / Permeability / Pleasant Bayou No. 1 Well / Pleasant Bayou No. 2 Well / Porosity / Reservoir engineering / Rock deformation / Sound velocity / Texas /

Abstract by Author

Tests have been run on cores retrieved from DOE-GCO Pleasant Bayou wells #1 and #2. These have included uniaxial compaction and triaxial loading tests (both jacketed and unjacketed). In each series of tests, deformation behavior, pore volume changes, permeabilities, and acoustic velocities have been measured. All of the tests reported have been carried out under rapid loading conditions and analyzed on the basis of pseudoelastic behavior. In addition to providing numerical data, the nonelastic and that dynamic data shows little relationship to static data. The values for compressibilities obtained from these tests are considerably lower than those used in some earlier production models.

1001. GGIS-100430/R/ / /M/ / / / /

Title- The Design and Evaluation of a Two-Phase Turbine for Low Quality Steam-Water Mixtures

Author(s)- / Comfort , William Jabez, III /

Publication date- May 16 , 1977

Pagination- 210 Pages

Report/patent- UCRL-52281

Available- NTIS

Geopressured Geothermal Bibliography

(Paper copy)
(Microfiche)
Local Availability- CES
Sponsor- / Energy Research and Development Administration,
Washington, D.C. (USA)
W-7405-ENG-48 /
Corporate Author- California Univ.
Lawrence Livermore Lab.
Livermore , USA
Auxiliary expression(s)-
Illus. / Diagram (30) / Photo (12) / Graph (26) /
Table
Ref.
Descriptor(s)- / Design / Efficiency / Evaluation / Expansion /
Geothermal energy conversion / Geothermal fluids / Laboratory
testing / Materials testing / Mathematical models / Nozzles /
Performance testing / Total flow systems / Turbines / Two phase
flow /
Abstract by Author

A new two-phase turbine has been designed, and built for testing in the laboratory, using a low quality steam-water mixture as a working fluid. This expander has been successfully tested in the laboratory as a part of the Lawrence Livermore Laboratory geothermal energy development program. The measured performance compares well with performance predictions of a numerical model of the expander. This report describes: (1) the details of the selection of the type of expander, (2) the design of an experimental expander for use in a clean two-phase flow laboratory experiment, (3) the development of a numerical model for performance analysis and extrapolations, (4) experiments including static cascade performance with two-phase fluid, disk friction and windage measurements, and two-phase performance measurements of the experimental expander, (5) comparisons of the numerical model and experimental results, and (6) The prediction of the performance of an advanced design, indicating how performance improvements can be achieved. An engine efficiency of 23 percent for a single-nozzle test was measured. Full admission performance, based upon the numerical model and achievable nozzle thrust coefficients indicate that an engine efficiency of between 38 and 48 percent can be realized with present technology. If maximum liquid removal loss is assumed, this performance range is predicted to be 38 to 41 percent. Droplet size reduction and the development and implementation of enhanced two-phase flow analysis techniques should make it possible to achieve the research goal of 70 percent engine efficiency.

1002. GGIS-100528/0/ / /A/ / / / /

Title- The Design-Well Site-Selection Process

Author(s)- / Wallace , Raymond H. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 223 , 3 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Illus. / Map (1) /

Table

Ref.

Descriptor(s)- / Aquifers / Evaluation / Fluid withdrawal /
Geopressed reservoirs / Site selection / Wells /

Abstract by Author

The sequence of steps leading to selection of optimum locations for design wells for geopressed geothermal resource evaluation is described. The steps are regional appraisal, trend appraisal, evaluation and ranking and well site location. The objective is to identify large volume, high temperature, high pressure, low salinity aquifers capable of high-rate fluid production and concomitant energy recovery.

1003. GGIS-100550/R/ / /M/ / / / /

Title- The Development of a Geopressed Energy Management
Information and Analysis System in Support of Research
Planning

(Annual Report March 1980-July 1981)

Subtitle- Phase I

Author(s)- / Bachman , Ann L. / Wrighton , Fred /

Publication date- September 1981

Pagination- 55 Pages

Report/patent- PB82-207366

Available- NITS

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRI-5080-321-0299 /

Corporate Author- Louisiana State Univ.

Baton Rouge , USA

Descriptor(s)- / Aquifers / Feasibility studies / Gas production /
Gases / Geopressed zones / Gulf Coast / Information systems /
Louisiana / Research programs / Resource potential / Texas /

Abstract by NTIS

Geopressed and normally pressured aquifers containing mobile gas in thin stringers, immobile gas and gas in solution are known to occur in the Gulf Coast area of Louisiana and Texas. If it should prove technically and economically feasible to produce this gas, this unconventional resource could make a substantial contribution to the nation's gas supply. It was the purpose of this study to develop an information system on the problems and potential of this resource as well as what is known about unconventional gas production in the Gulf Coast, and to use this information to formulate a research program to prove economic and technical feasibility. The research program includes 22 separate projects in 4 different programs. The process by which the research program was formulated, intermediate results and the program itself are summarized in this report.

1004. GGIS-100899/O/ / /A/ / / / /

Geopressured Geothermal Bibliography

Title- The Economic Generation of Electricity from Moderate Temperature Geothermal Resources

Author(s)- / Kunze , J.F. / Whitbeck , J.F. / Dart , R.H. /

Conference- 11 Intersociety Energy Conversion Engineering Conference

Pagination- Page 768 , 3 Pages

Report/patent- SAE--769135

Corporate Author- Idaho National Engineering Lab.

Idaho Falls , Idaho , USA

Auxiliary expression(s)-

Illus. / Graph (1) /

Descriptor(s)- / Binary fluid systems / Economics / Electric power / Elevated temperature / Flashed steam systems / Geothermal resources / Power generation /

Abstract by Author

The large energy potential of the medium temperature geothermal resource (125-170 DEG C) makes it attractive for power production. The lower efficiency inherent with lower source temperatures apriori leads to the conclusion that it will be difficult to show favorable economics. However, there are basic differences in the engineering approaches that can be applied which favor the use of moderate temperatures. These approaches which are being evaluated on the Raft River geothermal resource (150 DEG C) and the economics of power production from this resource, compared with more conventional thermal power systems, are presented in this paper.

1005. GGIS-100995/ / / /A/ / / / /

Title- The Economics of the Heat Pump as a Device to Assist in Geothermal District Space Heating

Author(s)- / Kunze , Jay. F. / Forsgren , Klane F. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 387 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Forsgren, Perkins and Associates

Rexburg , Idaho , USA

Auxiliary expression(s)-

Illus. / Graph (1) /

Table

Ref.

Descriptor(s)- / Direct energy utilization / District heating / Economics / Geothermal space heating / Hot water heating / Uses /

Abstract by Author (rev.)

Can heat pumps economically assist in geothermal space and water heating? If so, common cooler waters can be developed in addition to the rare hot resources which are now exploited. The case studies summarized in this paper consider source water of four temperatures: 55 DEG F, 80 DEG F, 130 DEG F and 180 DEG F. Since every one of the cases using heat pumps showed a combination of attractive economics and convenience, the test drilling for geothermal water is a sound investment. Regardless

of the water temperature discovered, the typical situation should lead to a "geothermal" heating system that is attractive if implemented on a large enough scale.

1006. GGIS-100407/O/ / /A/ / / / /

Title- The Economics of Geothermal, Solar and Conventional Space Heating

Author(s)- / Fassbender , Linda L. / Bloomster , Clarence H. / Price , Bobi A. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 707 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

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Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C. (USA) /

Auxiliary expression(s)-

Illus. / Map (2) /

Table

Ref.

Descriptor(s)- / Capital / Comparative evaluations / Cost / District heating / Economics / Energy demand / Fuels / Investment / Market / Mathematical models / Numerical analysis / Optimization / Production / Residential buildings / Solar energy / Space heating / Taxes /

Abstract by GGIS

An evaluation of the costs of residential heating in the United States is presented, and the most economic energy resource is specified by region. In the course of the study, these heating options were evaluated: fuel oil; natural gas; electric resistance; active solar; and geothermal district. Another objective was to determine conditions under which solar and geothermal heating would be competitive with each other and with conventional energy sources. In general, competition between solar or geothermal heating and conventional fuel sources depends upon the price and reliability of the conventional sources. Conclusions regarding the prospects for the various fuels are as follows: urban areas north of an imaginary line drawn from Los Angeles to Baltimore will find geothermal resources the most economic; solar fuel will be popular throughout the country, and especially in the suburban and rural areas in the intermountain West and in the Great Plains region (in most cases, a conventional fuel source will supplement the solar); conventional heating fuel sources will

Geopressured Geothermal Bibliography

continue to be popular in Southern urban areas (where the annual heating demand is low), in Northern urban areas too far from geothermal resources to use them, and in suburban and rural areas in the Pacific Northwest.

1007. GGIS-100374/O/ / /A/ / / / /

Title- The Effect of Acid Addition for Scale Control on Geothermal Field and Plant Systems

Subtitle- 3rd Session -- EPRI Progress Reports

Author(s)- / Reynolds , Stan L. /

Conference- 3rd Annual Geothermal Conference and Workshop Proceedings
Monterrey

California

USA (June 26 , 1979)

Publisher- Electric Power Research Institute
Palo Alto, California

Publication date- October 1979

Pagination- Page 9 , 6 Pages

Report/patent- EPRI-WS-79-166

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (1) /
Table

Descriptor(s)- / Calcite / Computer codes / Corrosion / Geothermal brines / Geothermal power plants / Scaling / Scaling control / Silica minerals / Sulfides /

Abstract by Author

A chemical equilibrium computer code (EQUILIB) has been developed which is designed to compute the changes in chemical species present in solid, liquid and gaseous phases of a geothermal brine. Specific objectives of this project are to use EQUILIB to: (1) verify EQUILIB operability from a user standpoint; (2) predict mineral precipitation in untreated (i.e., no acid added) brine under typical power cycle operation; (3) examine the effects of acid addition to brines under typical operating conditions; and (4) indicate the potential for problems of corrosion and adverse brine/rock interactions under typical geothermal operating conditions.

1008. GGIS-100407/O/ / /A/ / / / /

Title- The Effect of Human Judgement on Geothermal Leasing

Subtitle- A Case Study

Author(s)- / Coe , Barbara A. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 767 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

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95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Map (1) /

Ref.

Descriptor(s)- / Analysis / Case histories / Colorado / Environmental
policy / Geothermal resources / Government policies /
Institutional aspects / Land leasing / Leases / Management /
Mineral rights /

Abstract by GGIS

The behavioral aspect of decision making as it pertains to the environmental decisions necessary for geothermal energy development is discussed in this article. The impact of judgement policies on geothermal leasing activities is the focus of the inquiry. The method of inquiry was to analyze the case of Petro-Lewis' application for geothermal leases in the Chalk Creek area of Colorado. The analysis can be divided into areas concerning: judgement policies employed; the effect of those policies on the non-issuance of geothermal leases; and ways in which judgement analysis might be used in future situations.

1009. GGIS-100053/J/ / 2408/A/ / / / /

Title- The Effect of Overburden Stress on Geopressure Prediction
from Well Logs

Author(s)- / Eaton, Ben A. /

Journal- Journal of Petroleum Technology

Publication date- Vol. 24, Issue 8, August 1972

Pagination- Page 929, 6 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Petroleum prospecting / Well logging / Petroleum
reservoir engineering /

Abstract by NTIS

A theory is presented concerning the effect of overburden stress gradient on geopressure magnitude prediction. The theory involves the relationship of overburden stress, rock matrix stress, pore pressure, normal shale compaction, and the technique used to predict geopressure magnitudes from resistivity and sonic log data. It has been suggested elsewhere that commercial production is never found in geopressure environments where the log resistivity ratios exceed 3.50. This paper indicates that the limiting ratio is a function also of overburden stress gradient. The use of this ratio as an exploration tool is discussed. 8 refs.

1010. GGIS-100035/J/ / 6606/A/ / / / /

Title- The Effect of Salinity on the Maximum Geothermal Gradient of a Hydrothermal System at Hydrostatic Pressure

Author(s)- / Hass , J. L., JR. /

Journal- Economic Geology

Publication date- Vol. 66 , Issue 6 , September 31 , 1971

Pagination- Page 940 , 7 Pages

Descriptor(s)- / Boiling / Brines / Calcium / Chlorides / Depth / Geopressured systems / Hot springs / Hydrothermal systems / Mathematical models / Potassium / Salinity / Sodium / Temperature distribution / Temperature gradients / Thermal waters /

1011. GGIS-100308/0/ / /A/ / / / /

Title- The Effect of Temperature Level on Absolute Permeability of Unconsolidated Silica and Stainless Steel

Author(s)- / Danesh , A. / Ehlig-Economides , C. / Ramey , H.J. Jr. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 137 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

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95616

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (3) /

Ref.

Descriptor(s)- / Elevated temperature / Fluid flow / Geothermal fluids / Permeability / Pressure dependence / Quartz / Temperature dependence / Viscosity /

Abstract by Author

The absolute permeability of porous media may depend significantly on the flowing liquid. The permeabilities of unconsolidated samples of silica and stainless steel were shown to decrease with an increase in temperature for water flow. There was no effect with the temperature level for oil flow. The phenomenon may be a result of the intermolecular force field within the boundary layer of water adjacent to the solid which is different from that of the bulk water. The dependence of the physical properties of this layer, e.g., viscosity, with temperature is different from those of the bulk liquid. Hence the effect of the temperature level on the mobility of water through porous media cannot be adequately explained by time change with temperature of the bulk water viscosity alone.

1012. GGIS-100308/O/ / /A/ / / / /

Title- The Effects of Corrosion and Scale Deposits on the Capacity of Water Rejection Wells in Liquid Dominated Geothermal Systems

Author(s)- / Jorda , R.M. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 341 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

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95616

Local Availability- CES

Auxiliary expression(s)-

Table

Illus. / Graph (5) /

Ref.

Descriptor(s)- / Corrosion / Corrosive effects / Geothermal reservoirs / Gulf Coast / Hot water systems / Injection wells / Mathematical methods / Scaling / Texas / Well casings /

Abstract by Author

Scale deposits or corrosion damage in water reinjection well tubing strings can result in reduction of reinjection capacity, thereby limiting power recovery in liquid dominated geothermal systems. Simulation of a Texas Gulf Coast reinjection well under scaling and corrosive conditions indicates that either scale deposits or corrosion may require a tubing size of at least one nominal diameter larger than would be required if corrosion or scale deposition did not occur. This, in turn, would require the use of larger protective casing strings and bigger drilling bits.

1013. GGIS-100411/O/ / 1/A/ / / / /

Title- The Energy Potential of Geopressured Reservoirs

Subtitle- Hydrogeologic Factors

Author(s)- / Papadopoulos , Stavros S. /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 173 , 20 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Auxiliary expression(s)-

Illus. / Table (1) / Figure (13) /
Ref.

Descriptor(s)- / Geopressured systems / Information systems /
Lithology / Measuring methods / Monitoring / Pressure
measurement / Temperature measurement / Well drilling / Well
logging / Texas / Engineering geology / Geopressured reservoirs
/ South / Hidalgo County / Overburden pressure / Geopressure /
Geothermal energy / Production / Possibilities / United States /
Tertiary /

Abstract by Author

The energy potential of geothermal waters in the geopressured reservoirs of the Gulf Coast ultimately depends on the yield of wells tapping these reservoirs. An analysis is made to determine possible well yields on a geopressured reservoir in Hidalgo County, Texas. The reservoir lies beneath an area 16 kilometres (10 miles) wide and 48 kilometres (30 miles) long, with the long axis extending northeast-southwest parallel to and east of the McAllen Fault. The average pressure-to-depth ratio in the reservoir is 17 kilonewtons per square metre per metre (0.75 pound per square inch per foot). The average temperature of the water is 135 degrees C (275 degrees F), and the average salinity is about 25,000 milligrams per litre. On the basis of solubility data, the average methane content is estimated to be 4.8 standard cubic meters per cubic metre (standard cubic feet per cubic foot). Based on an idealized model of the reservoir, the results of the analysis indicate that a single 0.23-metre (0.75-foot) diameter well at the center of the reservoir could sustain a flow rate of 0.31 cubic metre per second (11 cubic feet per second) for 20 years. The total production rate from the reservoir could be increased to 2.7 cubic metres per second (95 cubic feet per second) for the 20-year period by assuming that a minimum flow rate of 0.15 cubic metre per second (5.3 cubic feet per second) per well is satisfactory and by developing the reservoir with 18 wells at optimum spacing. Estimates of subsidence under the 18-well production scheme indicate that the average subsidence over the reservoir area would be about 1 metre (3 feet) at the end of the 20-year production period. In the immediate vicinity of a centrally located well, subsidence would be about 2 metres (6 feet). The thermal, mechanical, and methane energy contained in the waters produced with the 18-well development scheme is equivalent to 11.32×10^{17} joules (10.73×10^{14} British Thermal Units). The thermal and mechanical energy components of this total could be converted to 94 megawatts (estimates) of electrical power over the 20-year production period. In addition to this analysis of a geopressured reservoir, the sensitivity of well yields to hydrogeologic factors is examined. It is concluded that the most important hydrogeologic factor in the development of geopressured reservoirs is the transmissivity. The results of calculations made for this sensitivity determination are presented graphically and can be used to make quick estimates of the yield of wells tapping geopressured reservoirs.

1014. GGIS-100240/J/ / /A/ / / / /

Title- The Federal Role in Geothermal Resource Development

Author(s)- / Stephens , Randall C. /

Journal- Land Water Law Review

Publication date- Vol. 13 , Issue 1 , 1977

Pagination- Page 187 , 15 Pages

Descriptor(s)- / Energy source development / Geothermal resources /
Government policies / Institutional aspects / National
government / Regulations /

Abstract by EIC

The private sector will ultimately determine the extent of geothermal energy use, but its decisions will be strongly influenced by the action, inactions, and policies of the federal government. Program strategy established through the Geothermal Energy Research, Development, and Demonstration Act of 1974 is outlined. The project's areas include; resource identification, technological development, institutional development, federal land management, federal taxation, and a loan guaranty. Federal, state, and local governmental regulation also play an important part in the institutional framework for geothermal development.

1015. GGIS-100042/J/ / /M/ / / / /**Title- The Geopressed Geothermal Resources of Texas**

(A Report on Legal Ownership and Royalty Issues)

Author(s)- / Oberbeck , A. W. /

Pagination- Page 18 , 21 Pages

Descriptor(s)- / Texas / Geopressed systems / Depths / Legal aspects
/ Regulations / Analysis / Laws / Case histories /-----
1016. GGIS-100140/B/ / /M/ / / / /**Title- The Geopressed Geothermal Resources of Texas**

Subtitle- A Report on Legal Ownership and Royalty Issues

Author(s)- / Oberbeck , A. W. /

Publication date- January 27 , 1977

Pagination- 55 Pages

Available- Center for Energy Studies

Engineering Science Bldg. 143

University of Texas at Austin

Austin

Texas

78712)

Corporate Author- Texas University, Austin

Center for Energy Studies

Austin , Texas , USA

Descriptor(s)- / Geopressed resources / Legal aspects / Leasing /
Mineral resources / Ownership / Royalties / Salt water /
Subsurface waters / Texas / Water resources /

Abstract by Energy Studies

Because the geopressed-geothermal resources of Texas are new and commercially undeveloped, their legal identity has not yet been established conclusively. Several unresolved legal issues exist which hinder development. This report outlines the

Geopressured Geothermal Bibliography

laws on this subject and surveys the legal decisions that have been made. The report recommends that categorizing geopressured resources as mineral resources rather than water resources would be most correct and most beneficial to the public interest.

1017. GGIS-100145/B/ / /M/ / / / /

Title- The Geopressured Geothermal Resources of Texas

Subtitle- Regulatory Controls over Water Pollution

Author(s)- / Rogers , K. E. / Oberbeck , A. W. /

Publication date- July 1 , 1977

Pagination- 85 Pages

Available- Center for Energy Studies

Engineering Science Bldg. 143

University of Texas at Austin

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Sponsor- / ERDA

EY-76-S-05-5243 /

Corporate Author- Texas University, Austin

Center for Energy Studies

Austin , Texas , USA

Descriptor(s)- / Liquid wastes / Pollution regulations / Surface waters / Texas / Waste disposal / Waste injection / Water pollution control / Water quality /

Abstract by Energy Studies

This report is a comprehensive survey of the federal and state regulations that pertain to the development of geopressured-geothermal resources along the Texas Gulf Coast. Heat, salinity, and possible presence of trace minerals in the water from the geopressured zones are the main pollutants that are anticipated. The difficulty and cost of properly disposing of waste fluids will strongly influence the ultimate feasibility of geopressured-geothermal development. Regulations in this area are myriad, as this report explains in detail, and they are often complicated, ambiguous, or contradictory.

1018. GGIS-100593/R/ / /M/ / / / /

Title- The Geopressured-Geothermal Resource of the Texas and Louisiana Gulf Coast

Subtitle- A Technology Characterization and Environmental Assessment

Author(s)- / Usibelli , Anthony / Deibler , Peter / Satnaye , Jayant /

Publication date- December 1980

Pagination- 250 Pages

Report/patent- LBL-11539

Available- NTIS

(Paper copy)

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C. (USA). Office of
Technology Imp acts
W-7405-ENG-48 /

Corporate Author- California Univ.
Lawrence Berkeley Lab.
Berkeley , USA

Auxiliary expression(s)-
Illus. / Diagram (37) / Figure (5) / Graph (10) / Map (5) /
Table
Ref.

Descriptor(s)- / Brine treatment / Environmental impact statements /
Feasibility studies / Geopressure resources / Geothermal
resources / Gulf Coast / Louisiana / Subsidence / Technology
assessment / Texas / Waste disposal / Well completion / Well
drilling /

Abstract by GGIS

Two areas of concern in using the geopressured geothermal
resources of the Texas and Louisiana Gulf Coast are technology
and environment. The technological requirements for well
drilling, completion and energy conversion as well as the
environmental impacts of using the resource are examined.

1019. GGIS-100585/R/ / /M/ / / / /

Title- The Geopressured-Geothermal Resources of Texas

Subtitle- A Report on Legal Ownership and Royalty Issues

Author(s)- / Oberbeck , A.W. /

Publication date- 1977

Pagination- 52 Pages

Local Availability- CES

Auxiliary expression(s)-
Table

Descriptor(s)- / Government policies / Legal aspects / Legislation /
Ownership / Royalties / Texas /

1020. GGIS-100407/O/ / /A/ / / / /

Title- The Geothermal Loan Guaranty Program

Subtitle- Recommendations for Improvement In cluding New Simplified
Application Procedures for Small Projects

Author(s)- / Meyer , Richard T. / Coe , Barbara A. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal
Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 751 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

Geopressured Geothermal Bibliography

P.O. Box 98
Davis
CA
95616

Local Availability- GGIS

Sponsor- / Department of Energy, San Francisco, CA (USA). San Francisco Operations Office

Sponsor- / EG and G Idaho, Inc., Idaho Falls (USA)

Sponsor- / Department of Energy, San Francisco, CA (USA). San Francisco Operations Office

Sponsor- / EG and G Idaho, Inc., Idaho Falls, (USA) /

Descriptor(s)- / Financial incentives / Financing / Geothermal energy / Industry / Investment / Legislation / Recommendations / Regulations / US DOE /

Abstract by GGIS

The Geothermal Loan Guaranty Program was established by Congress in 1974 with the intent to assist industry in financing the development and commercialization of geothermal energy. The program has been viewed by some, however, as being inaccessible to small business. The fact that by April 1980 only four projects had been approved for loans supports this view. This article examines the loan program as the small business and the smaller lending institutions have encountered it. Recommendations for changes in the program are made in three areas: administration; legislation; and regulation. These changes should provide more opportunity for small businesses to participate in the loan guaranty program.

1021. GGIS-100407/O/ / /A/ / / / /

Title- The Geothermal Progress Monitor

Author(s)- / Lopez, Albert F. / Entingh, Daniel J. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 807 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project Manager: Vasek W. Roberts

Available- Geothermal Resources Council

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Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (2) /

Table

Ref.

Descriptor(s)- / Cost / Data acquisition systems / Data compilation / Energy policy / Environmental policy / Geothermal energy / Geothermal industry / Government policies / Information /

Information systems / Investment / Legislation / Management /
Regulations / Research programs / US DOE /
Abstract by GGIS

The Geothermal Progress Monitor is a system designed to gather information about geothermal development activity in the United States and to assess the rate of the development of this alternative energy resource. The system uses a set of indicators to measure this activity. These indicators are: leasing activity; drilling effort; feasibility studies; construction plans; construction progress; installation costs; investment levels; environmental study; legislative and regulatory status of events; and government investment. Change in the relative importance of these indicators is acknowledged, as is the possibility that new indicators may be added as needed.

1022. GGIS-100074/B/ / /M/ / / / /

Title- The Gulf Coast Geosyncline

(Reprint from New Orleans Geological Society, May 1973)

Author(s)- / Durham /

Publisher- Houston Geological Society
Houston, Texas (U.S.A.)

Publication date- 1974

Pagination- 14 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Gulf of Mexico / Structural geology / Geosynclines /
North / Evolution / Origin / Crust / Salt tectonics / Faults /
Geopressure resources / Mesozoic / Cenozoic Era / Gulf Coast /
Salt domes / Ridges / Massifs / Diapirs / Louann Salt / Marine
geology /

1023. GGIS-100042/J/ / /A/ / / / /

Title- The Habendum Clause of a Geothermal Resources Lease

Subtitle- A Suggestion

Author(s)- / McNamara , Jack /

Publication date- Vol. 6 , Issue 4 , April 1978

Pagination- Page 17 , 3 Pages

Descriptor(s)- / Geothermal resources / Leases / Leasing / Legal
aspects /

Abstract by Energy Info. Abstracts

The habendum clause of a geothermal lease is examined with emphasis on the construction and selection of language used in such clauses. The habendum clause defines the duration, or term of the agreement between lessor and lessee of geothermal resources. Since uncertainties persist as to just what geothermal resources actually are, the clauses must be clarified to avoid future legal controversy. The aim of revised wording of the habendum clause is to create a geothermal lease that takes account of the current state of both geothermal development and the regulations devoted to it. A revised reading of the habendum clause is presented. The major revision suggested is that a lease should contain a primary term of not less than 15 years

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ranging to 20 or even 25 years. The lessor should be compensated for the additional term. Other suggestions serve to simplify the unnecessarily arcane lease forms that are unintelligible to the layman.

1024. GGIS-100465/R/ / /M/ / / / /

Title- The Impact of State and Federal Law on Development of Geothermal Resources in Texas

(Project L/R-9)

Author(s)- / Edwards , Tom /

Publication date- October 31 , 1974

Pagination- 52 Pages

Available- Texas State Library

1201 Brazos

Austin

TX

(Paper copy)

Local Availability- GGIS

Corporate Author- Texas Governor's Energy Advisory Council

Austin , USA

Descriptor(s)- / Geopressured resources / Geothermal fluids / Geothermal resources / Gulf Coast / Laws / Legal aspects / Methane / Production / Regulations / Resource development / Texas / Texas Railroad Commission / Texas Water Quality Board /

Abstract by Author (revised)

Recent geological studies indicate that Texas is potentially a major producer of geothermal energy. One of the impediments to the development of this resource, given the sizable commitments of capital required for development, is the uncertain legal status of geothermal resources. This report attempts to locate geothermal resources within the general framework of Texas property law and to determine whether these resources can be developed under existing law.

1025. GGIS-100407/O/ / /A/ / / / /

Title- The Importance of the Specific Heat Anomaly in the Design of Binary Rankine Cycle Power Plants

Author(s)- / Pope , William L. / Doyle , Padraic A. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 523 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasek W. Roberts

Available- Geothermal Resources Council

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Local Availability- GGIS
Auxiliary expression(s)-
Illus. / Graph (4) /
Ref.
Descriptor(s)- / Binary cycle power generation / Binary cycles /
Energy conversion / Fluid properties / Geothermal power plants /
Heat / Rakine cycle / Rakine cycle power systems / Thermodynamic
properties / Turbines / Working fluids /
Abstract by GGIS

The main objective of this report is to present an overview of recent research that might provide insight into working fluid and turbine state selections for the geothermal binary Rakine power cycle. Recent interest in geothermal development has spurred research into the technology for general Rakine cycle working fluid selections. Current research indicates the transposed critical temperature is an important thermodynamic property in the selection of working fluids and turbine states for geothermal power plants operating on a closed binary Rakine cycle.

1026. GGIS-100549/R/ / /M/ / / / /

Title- The Interrelationships and Variations of the Resistivity, Porosity, and Permeability as Functions of Pressure in a Geopressured Reservoir

Author(s)- / Ashman , Thomas Robert /

Publication date- August 1981

Pagination- 157 Pages

Report/patent- AFIT-CI-81-61T

Corporate Author- Air Force Inst. of Tech.

Wright-Patterson AFB , OH , USA

Descriptor(s)- / Brazoria County / Fluid withdrawal / Forecasting /
Permeability / Porosity / Resistivity surveys / Rock deformation
/ Simulation / Stresses / Testing / Texas /

Abstract by NTIS

Fluid production from both normally and abnormally pressured reservoirs has long been recognized as a function of the formation fluid properties and the reservoir rock parameters. Fluid production itself, however, changes the stress state of the reservoir resulting in rock deformation which affects total fluid and, therefore, energy recovery. This study was undertaken as part of a project to determine and predict the effects of fluid production on the Pleasant Bayou geopressured, geothermal reservoir in Brazoria County, Texas. Data was collected from triaxial loading tests conducted on sandstone samples cored from the potential producing horizons of the reservoir. All tests were conducted at overburden and pore pressures which simulated in situ conditions. Empirical relations were developed which reflected changes in the resistivity, porosity, and permeability as functions of the effective stress. Relationships among the parameters were found to be of practical use in predicting formation changes as the reservoir stress state changed due to fluid withdrawal. Results showed that the resistivity, porosity, and permeability were

Geopressured Geothermal Bibliography

dependent on the effective stresses in the reservoir. The cementation factor in Archie's equation was also found to be a pressure function.

1027. GGIS-100152/R/ / /A/ / / / /

Title- The Marysville, Montana Geothermal Project

(Annual Report No. 1)

Subtitle- Part 1

Author(s)- / McSpadden , William R. / Eliason , Jay R. / Kuwada , James / Bott , Winston /

Publication date- June 1974

Pagination- 147 Pages

Report/patent- PB-248-213

Note- See also PB248214 Prepared in cooperation with Rogers Engineering Co., Inc., San Francisco, Calif., Southern Methodist Univ., Dallas, Tex., and Systems, Science and Software, La Jolla, Calif.

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES MF

Corporate Author- Battelle Pacific Northwest Labs.

Richland , Washington , USA

Descriptor(s)- / Geothermal prospecting / Geothermal exploration / Heat transfer / Temperature measurement / Drilling / Environmental impacts / Geothermal resources / Geophysical exploration / Infrared mapping / Infrared photography / Montana / Mathematical models / Computerized simulation / Tables (data) / Graphs (charts) / Marysville (Montana) / Energy resources / Aerial surveys / Environmental effects / Geophysical surveys / Graphs / Heat flow / Infrared surveys / Marysville KGRA / Simulation / Tables /

Abstract by NTIS

The purpose of this project is to research the geothermal region near Marysville, Montana, to determine the nature and size of the resource, how the energy might be extracted, the potential monetary value of the energy, and how similar resources elsewhere might be located. Part 1 includes a project summary, description of Marysville area, summary of site construction work, the drilling program, the 1974 environmental analysis, a summary of geophysical surveys and a preliminary survey of the area using aerial thermal infrared imaging techniques. Heat flow data are included.

1028. GGIS-100260/R/ / /M/ / / / /

Title- The Methodology

Subtitle- 3rd Volume

Author(s)- / Kuuskraa , V.A. / Brashear , J.P. / Doscher , T.M. / Elkins , L.E. /

Publication date- Vol. 3 , February 1979

Pagination- 407 Pages

Report/patent- HCP/T2705-03

Available- NTIS

(Paper Copy)
(Microfiche)

Corporate Author- Lewin and Associates, Inc.
Washington , D.C. , USA

Descriptor(s)- / Aquifers / Economics / Gas production / Geopressed
systems / Gulf Coast / Methane / Technology assessment / Enhanced
recovery / Forecasting / Tables /

Abstract by TIC

The methodology is described in chapters on the analytic approach, estimated natural gas production, recovery from tight gas sands, recovery from Devonian shales, recovery from coal seams, and recovery from geopressed aquifers.

1029. GGIS-100331/ / / /M/ / / / /

Title- The National Energy Act

Publication date- November 1978

Pagination- 48 Pages

Local Availability- CES

Corporate Author- U.S. Department of Energy
Office of Public Affairs
Washington , D.C. , USA

Descriptor(s)- / Charges / Energy source development / Gas production
/ Geopressure resources / Natural gas / Regulations / Taxes /
Financial incentives / Public utilities / Financing /
Deregulation /

Abstract by Energyline

The National Energy Act of 1978 is designed to conserve U.S. energy supplies, to accelerate the shift to coal and the use of fuels other than oil and gas, and to reduce U.S. oil imports. The act, which was passed by Congress almost a year and a half after it was proposed in April 1977, consist of five bills: the National Energy Conservation Policy Act of 1978; the Power Plant and Industrial Fuel Use Act of 1978; the Public Utility Regulatory Policies Act of 1978; the Natural Gas Policy Act of 1978; and the Energy Tax Act of 1978. The Conservation Act provides for a utility conservation program for residences, weatherizaion grants for low income families, a \$100 million solar energy loan program, an energy efficiency improvement program for schools and hospitals, energy audits for public buildings, appliance efficiency standards, and civil penalties for automobile fuel efficiency standards, standards enforcement. The Fuel Use Act prohibits the use of natural gas for boiler fuel, and establishes an \$800 million pollution control loan program for utilities. The Utility Policies Act proposes 11 voluntary rate design standards, establishes rules to promote the use of cogeneration, grants loans to aid development of small hydroelectric facilities, and institutes a process for expediting the issuance of permits for a crude oil transportation system. The Natural Gas Act sets a series of maximum price limits for various categories of gas, deregulates new gas and certain intrastate gas as of 1985, establishes incremental gas pricing procedures, and grants to the President emergency authority for allocating gas supplies to high priority users. The Energy Tax Act provides residential insulation,

conservation, and solar energy tax credits; exempts gasohol from the federal excise tax; imposes a graduated excise tax on gas guzzling automobiles; grants incentives for geothermal resource development and geopressured natural gas development; allows minimum tax exclusion for intangible oil and gas drilling costs; and denies investment tax credits for new oil and gas burners. The estimated imported oil savings from the five bills will total from 2,390,000-2,950,000 BPD by 1985. The natural gas bill will save an estimated 1.0-1.4 million BPD, depending on the degree of oil displacement that results from increased gas supplies.

1030. GGIS-100350/J/ / /A/ / / / /

Title- The New Gas Bonanza

Author(s)- / Sheils , Merrill / Cook , William J. / Henkoff , Ronald /
Simons , Pamela Ellis / Donosky , Lea /

Journal- Newsweek

Publication date- Vol. 92 , Issue 18 , October 30 , 1978

Pagination- Page 64 , 3 Pages

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (1) / Photo (1) /

Descriptor(s)- / Cost / Deep drilling / Deregulation / Energy policy /
Geopressured zones / Natural gas /

Abstract by Energyline

In an about-face from previous policy, the Carter Administration placed natural gas at the center of the Nation's energy efforts. Deregulation is expected to provide a stimulus for developing new supplies, especially from deep wells. Problems of deep drilling, including high cost and technical difficulties, will have to be overcome. Among the more promising exotic sources of natural gas that will be developed are Devonian shales, western tight sands, geopressured zones, and coal seams.

1031. GGIS-100411/O/ / 1/A/ / / / /

Title- The Origin and Detailed Occurrence of the Resource

(1st Session)

Author(s)- / Dorfman , Myron H. /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 13 , 86 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

1032. GGIS-100044/J/ / 1708/A/ / / / /

Title- The Petroleum Geology of Young Regressive Sequences

Author(s)- / Chapman , Richard E. /
 Publisher- Houston Geological Society
 Journal- Houston Geological Society Bulletin
 Publication date- Vol. 17 , Issue 8 , 1975
 Pagination- Page 2
 Descriptor(s)- / Petroleum / Origin / Accumulation / Migration /
 Retarded / Relation / Pressure buildup / Clay / Regressive /
 Engineering geology / Materials / Property / Undercompaction /
 Geopressure /

 1033. GGIS-100081/B/ / /M/ / / / /

Title- The Potential for Energy Production from Geothermal Resources
 Subtitle- Report of the Subcommittee on Water and Power Resources,
 Committee on Interior and Insular Affairs
 Publisher- United States of America
 Washington, D.C. (USA)
 Publication date- December 1973
 Available- GPO)
 Corporate Author- U.S. 93. Congress, 1. Session Senate Committee on
 Interior Insular Affairs, Subcommittee on Water and Power
 Resources
 Washington , D.C. , USA
 Descriptor(s)- / Dry-steam systems / Energy policy / Environmental
 effects / Geopressured systems / Geothermal energy / Geothermal
 resources / Government policies / Hot dry rock systems / Hot
 water systems / Legislation / Research programs / Economics /
 Financing /

 1034. GGIS-100164/J/ / /A/ / / / /

Title- The Potential for Geothermal Steam
 Author(s)- / Otte , C. /
 Publication date- Vol. 72 , Issue 7 , July 1976
 Pagination- Page 80 , 3 Pages
 Auxiliary expression(s)-
 Illus. / Figure (2) /
 Table
 Descriptor(s)- / California / Electric potential / Flashing /
 Geothermal systems / Geysers Geothermal Field / Natural steam /
 Power generation / Steam /
 Abstract by WRA
 Molten magma near the surface produces high temperature
 zones at shallow depths along tectonic plate margins. Nearby
 ground water or water of crystallization will flash into steam
 when drilled wells release the overlying pressure. Steam or hot
 water can be converted to electricity or used in industrial
 process applications. The Geysers north of San Francisco has the
 world's largest installed capacity; 520,000 kw. Hard rocks
 typical of potential sites make drilling difficult. Geothermal
 wells cost 50% more than comparable oil wells. The low quality
 heat produced must be used locally or converted to electricity.
 Although not necessarily cheaper than fossil fuels, geothermal
 energy can be effective from smaller units. Geothermal

Geopressured Geothermal Bibliography

potential may exist for 20 million kw with utilization of low temperature deposits and development of geopressured systems and dry rock technology, thus reducing utilities' demand and foreign imports of fossil fuels.

1035. GGIS-100315/0/ / /A/ / / / /

Title- The Potential of Geothermal Resources

Author(s)- / Barnea , J. /

Conference- International Scientific Forum on an Acceptable Nuclear Energy Future of the World

Fort Lauderdale

Florida

USA (November 7 , 1977)

Publisher- Ballinger Pub. Co.

Cambridge, Massachusetts

Publication date- 1978

Pagination- 5 Pages

Local Availability- ENG

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Geopressured zones / Geothermal drilling / Geothermal power plants / Hot dry rock systems / Hot water systems / Louisiana / Magma systems / Methane / Resource assessment / Texas / Vapor dominated systems / Geothermal brines / Geothermal heating /

Abstract by Energyline

In every country in which they operate, geothermal power stations produce electricity more cheaply than it can be produced by nuclear power stations. Yet geothermal energy is the most poorly funded and researched of all known renewable resources. The six types of geothermal resources (dry steam fields, hot water fields, low enthalpy geothermal water, geopressured zones, hot dry rock, and magma) are reviewed, and geological and geographical areas of their occurrence are outlined. It is predicted that there will be a meteoric rise in geothermal drilling in the next 22 years, and that geothermal energy will be an important source of low cost energy by the year 2000.

1036. GGIS-100042/J/ / /A/ / / / /

Title- The Private Sector in Geothermal and Hydrothermal Resource Development

Author(s)- / Rodzianko , Paul /

Publication date- Vol. 6 , Issue 4 , April 1978

Pagination- Page 40 , 4 Pages

Descriptor(s)- / Financing / Energy source development / Investment / Reliability / Risks / Uses /

Abstract by Energy Information Abstracts

The role of the private sector in geothermal and hydrothermal resource development is explored. Factors indicating the need for the private sector to learn from past successful geothermal development experiences to minimize unnecessary front end field

investment in favor of smaller initial unit sizes are given. These factors are; the impact of field investment; reservoir risk; base load reliability; resource utilization; and utility financing constraints. A recommendation to solve the complicated impasse between the developer and the utility consists of matching front end field investment to smaller initial unit sizes and developing a capital base specifically designed to accept reservoir risk. Suggested is a technique for implementing the recommendation that involves the forming of a company designated to; accept reservoir risks; purchase the geothermal resource at the wellhead; own, finance, and construct the needed power plant; and sell electricity to the utility.

1037. GGIS-100995/ / / /A/ / / / /

Title- The Private Sector in Hydrothermal Resource Development

Author(s)- / Rodzianko , Paul /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 583 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Descriptor(s)- / Energy source development / Electric power /
Financing / Geothermal industry / Geothermal reservoirs /
Geothermal resource / Investment / Power generation /

Abstract by Author (rev.)

For a highly-regulated utility to commit its own funds for the construction of a power generation facility, an exploration company must invest great amounts of front-end drilling and testing dollars to "prove" a geothermal reservoir. In order to generate a satisfactory rate of return on such an investment, the resource company is forced to look at 55 MW units, not smaller ones, as the starting point for reservoir development. To date, however, no utility has been willing to finance and construct, at its own risk, a power plant on this basis. The considerations outlined in this paper (impact of field investment, reservoir risk, base load reliability, resource utilization, and utility financing constraints) point out the need for the private sector to learn from past successful geothermal development experiences and thus minimize front-end field investment in anticipation of smaller initial unit sizes. Implicit in this approach is the recognition of the crucial need for reservoir operating experience particularly at the early stages of field development. Upon these beginnings can be built the firm financial foundation necessary for a thriving and sustained development in the geothermal industry.

1038. GGIS-100260/R/ / /M/ / / / /

Title- The Program

Geopressured Geothermal Bibliography

Subtitle- 2nd Volume
Author(s)- / Kuuskraa , V.A. / Brashear , J.P / Doshcher , T.M. /
Elkins , L.E. /
Publication date- Vol. 2 , October 1978
Pagination- 568 Pages
Report/patent- HCP/T2705-02
Available- NTIS
(Paper Copy)
(Microfiche)
Corporate Author- Lewin and Associates, Inc.
Washington , D.C. , USA
Descriptor(s)- / Aquifers / Coal deposits / Devonian period /
Economics / Enhanced recovery / Geopressure resources / Methane
/ Natural gas / Oil shale / Planning / Research programs /

Abstract by TIC

This study was conducted to assist public decision- makers in selecting among many choices to obtain new gas supplies by addressing 2 questions: 1) how severe is the need for additional future supplies of natural gas; and 2) what is the economic potential of providing part of future supply through enhanced recovery from unconventional natural gas resources. The study also serves to assist the DOE in designing a cost-effective R and D program to stimulate industry to recover this unconventional gas and to produce it sooner. Tight gas basins, Devonian shale, methane from coal seams, and methane from geopressured aquifers are considered. It is concluded that unconventional sources, already providing about 1 Tcf per year, could provide from 3 to 4 Tcf in 1985 and from 6 to 8 Tcf in 1990 (at \$1.75 and \$3.00 per Mcf, respectively). However, even with these additions to supply, gas supply is projected to remain below 1977 usage levels.

1039. GGIS-100393/O/ / /A/ / / / /

Title- The Resource Assessment Scheduling, and Economics of
Developing the Geopressured-Geothermal Resource in Texas

Author(s)- / Cornwell , John B. / Lesso , William G. / Zinn , C. Dale
/

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 3 , June 1980

Pagination- Page 1545 , 29 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

USA

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

DE-AS08-78ET-27087 /

Corporate Author- Texas Univ.

Center for Energy Studies

Austin , USA

Auxiliary expression(s)-

Illus. / Graph (2) / Figure (4) /

Table

Descriptor(s)- / Computerized simulation / Cost / Economics / Fairway analysis / Feasibility studies / Fluid flow / Geopressure resources / Models / Resource assessment / Resource development / Resource potential / Systems analysis / Texas /

Abstract by Author

For the geopressured-geothermal resource to be a viable source of energy, a number of physical and economic conditions must be met. A fair amount of uncertainty exists with regard to these factors. In order to evaluate the impact of these uncertainties, a series of models has been developed to assess the feasibility of the resource under known and/or best estimate conditions and to determine the minimum acceptable values. The first model assesses the individual fairways' ability to provide a designated flow for one well for a set minimum lifetime. The fairways which cannot meet the minimum requirements are dismissed as possible development candidates. The second model takes the usable fairways and produces a development scenario based upon chosen "hit" probabilities. This model yields a time line for the introduction of the resource based upon the aggressiveness of the development chosen, i.e., the number of rigs available. The third model performs an economic analysis of the fairway development scenarios based upon the time line history, total number of wells, required investment, and methane recovered. This analysis uses a present worth analysis that takes into account the required investment, revenues, operating cost, and economic life. Currently, only a few of the fairways show promise of being viable sources based on physical properties, and then only if the price of natural gas is substantially increased over its current value.

1040. GGIS-100407/O/ / /A/ / / / /

Title- The Role of Gas and Electric Utilities in Direct Applications of Geothermal Energy

Author(s)- / King , Diana /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 799 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-
Ref.

Geopressured Geothermal Bibliography

Descriptor(s)- / Contracts / Development / Direct energy utilization / District cooling / District heating / Electric power / Energy demand / Energy source development / Exploitation / Investment / Management / Natural gas / Planning / Power generation / Public utilities / Research programs / Trade /

Abstract by GGIS

Development activities for direct heat applications of geothermal energy include establishing an energy distribution system. It is likely that gas and electric utilities would assist in distributing the resource. A study of gas and electric utilities and their probable role in distributing the resource was undertaken and is described in this article. In general, large utilities have little interest in direct application of geothermal energy because they view it as being too small to treat as a new business venture and also insignificant in being able to improve the efficiency of the existing system. Smaller utilities, however, have shown an interest in geothermal direct applications.

1041. GGIS-100240/J/ / /A/ / / / /

Title- The Role of Municipalities in Geothermal Resource Development

Author(s)- / Kramer , William K. / Hammer , Michael /

Journal- Land Water Law Review

Publication date- Vol. 13 , Issue 1 , 1977

Pagination- Page 85 , 23 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Contracts / Energy source development / Geothermal resources / Public utilities / Urban areas / California / Exploitation / Geothermal exploration / Laws / Legal aspects /

Abstract by EIC

Approximately 900 publicly owned electrical systems generate all or part of their own power requirements, and about 125 of these are in western states, where geothermal energy production seems most promising. Provisions of California law affecting municipal utilities' interest in geothermal exploration, development, and exploitation are explored. Various problems encountered by the City of Burbank and the Northern California Power Agency are specifically examined. The impacts of self-imposed limitations in the form of outstanding bond covenants and other contractual obligations are discussed.

1042. GGIS-100411/O/ / 1/A/ / / / /

Title- The Role of Public Lands in Geothermal Energy

Author(s)- / Armstrong , B. /

Conference- 2nd Geopressured Geothermal Energy Conference

Austin

Texas

USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 327 , 8 Pages

Available- Center for Energy Studies)

Available- NTIS
 (Paper copy)
 (Microform)
 Auxiliary expression(s)-
 Discuss.
 Descriptor(s)- / Texas / Environmental geology / Land use / West /
 Gulf Coast / Control / Public lands / Geothermal energy /
 Geopressure / Resources / Energy source development / United
 States /

 1043. GGIS-100407/O/ / /A/ / / / /

Title- The State Coupled Program

Subtitle- A New Emphasis

Author(s)- / Foley , Duncan / Blackett , Robert E. / Brophy , Gerald
 P. / Mink , Leland L. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal
 Energy for the Eighties)
 Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
 Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 779 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (2) /

Table

Ref.

Descriptor(s)- / Commercialization / Data acquisitions systems / Data
 analysis / Data compilation / Drilling / Feasibility studies /
 Geothermal fluids / Geothermal resources / Hydrothermal systems
 / Information needs / Planning / Regional analysis / Research
 programs / Resources / US DOE /

Abstract by GGIS

State resource assessment team tasks are given new direction
 with the initiation of the User Coupled Confirmation Drilling
 Program in federal FY 81. An overview of these activities is
 presented in this article. Activities follow this general
 outline: take inventory of potential hydrothermal resources in
 the state; perform a regional analysis of this information and
 issue state resource maps for the public; produce technical maps
 and reports; and confirm specific hydrothermal resources through
 the User Coupled Confirmation Drilling Program.

1044. GGIS-100899/O/ / /A/ / / / /

Title- The Subterrene Rock-Melting Concept Applied to the
Production of Deep Geothermal Wells

Author(s)- / Altseimer, John H. /

Conference- 11 Intersociety Energy Conversion Engineering Conference
State Line
Nevada

USA (September 12 , 1976)

Publication date- Vol. 1 , September 12 , 1976

Pagination- Page 717 , 7 Pages

Note- Work performed under the auspices of the U.S. Energy and
Research Development Administration

Available- American Institute of Chemical Engineers

345 E. 47 Street

New York City

New York

10017

Local Availability- Eng.

Auxiliary expression(s)-

Illus. / Photo. (2) / Diagram (3) / Graph (7) /

Ref.

Descriptor(s)- / Cost / Drill bits / Drill pipes / Drilling equipment
/ Drilling fluids / Drilling / Geothermal drilling / Subterrene
penetrators /

Abstract by Author

The drilling of wells comprises a large fraction of the costs of geothermal energy-extraction plants, and billions of dollars for wells will be needed before geothermal energy is nationally significant. Technical and cost studies were made of the application of the Subterrene concept, i.e., excavating and penetrating rocks or soils by melting, to deep wells such as may be used for dry-hot-rock or geopressure geothermal energy extraction systems. Technically, it was found that Subterrene requirements are compatible with those of current rotary drilling practices. Certain features of the rock-melting concept such as the glass lining on the borehole wall, and nonrotation, provide opportunities for the development of better well production techniques in hot wells. A typical optimum-cost well would be rotary-drilled in the upper regions and then rock-melted to total depth. Indicated cost savings are significant: a 33% or 4.5 million dollars reduction from rotary drilled well costs are estimated for a 10 km depth well with bottom hole temperatures of 673 K. Even for normal geothermal gradient conditions, the savings for the 10 km depth is estimated as 23% or 2 million dollars.

1045. GGIS-100407/O/ / /A/ / / / /

Title- The Temperature Dependence of Permeability

Author(s)- / Gobran, Brian D. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal
Energy for the Eighties)
Salt Lake City

Utah
 USA (September 9 , 1980)
 Publisher- Geothermal Resources Council
 Davis, CA
 Publication date- Vol. 4 , 1980
 Pagination- Page 397 , 4 Pages
 Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasei W. Roberts
 Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 CA
 95616
 Local Availability- GGIS
 Sponsor- / Department of Energy, Washington, D.C. (USA)
 E(04-3)1265 /
 Auxiliary expression(s)-
 Illus. / Diagram (1) / Graph (4) /
 Ref.
 Descriptor(s)- / Correlation / Elevated temperature / Equipment /
 Experimental results / Geothermal reservoirs / Heat storage /
 Laboratory equipment / Measuring methods / Permeability / Sand /
 Temperature dependence / Waste injection /
 Abstract by GGIS

Reservoir permeability affects both fluid production from the reservoir and fluid injection into the reservoir; thus, reliable permeability measurement is critical to accurate reservoir simulation and/or production forecasting. Recent studies have determined that permeability operates as a function of temperature, the temperature effect being dependent on the porous medium and the fluid. The highest permeability change as a function of temperature occurs when sand and water are the interacting porous medium and fluid. In this study the absolute permeability of confined Ottawa sand to water has been measured over a range of temperatures to 177 deg C. The final objective of this work has been to arrive at a method of correlating room temperature measurements with reservoir values.

 1046. GGIS-100995/ / / /A/ / / / /

Title- The Thermodynamic and Cost Benefits of a Floating Cooling Geothermal Binary Cycle Power Plant at Heber, California
 Author(s)- / Pines , H.S. / Pope , W.L. / Green , M.A. / Doyle , P.A.
 / Silvester , L.F. / Fulton , R.L. /
 Publication date- Vol. 2 , Issue 2 , 1978
 Pagination- Page 531 , 6 Pages
 Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 California
 95616
 Local Availability- CES
 Corporate Author- California Univ., Berkeley
 Lawrence Berkeley Lab.
 Berkeley , California , USA
 Auxiliary expression(s)-

Geopressured Geothermal Bibliography

Illus. / Graph (4) / Diagram (2) /
Table
Ref.

Descriptor(s)- / Binary cycle power generation / California /
Computer codes / Cooling systems / Cost benefit analysis /
Economics / Elevated temperature / Geothermal fluids /
Geothermal power plants / Models / Waste heat / 2-methylpropane /

Abstract by Author

The application of the floating cooling concept to evaporative heat rejection systems is studied as a method of improving the performance of geothermal powerplants operating upon medium temperature hydrothermal resources. The LBL thermodynamic process computer code GEOTHM is used in the case study of a 50 MWe isobutane binary cycle power plant at Heber, California. It is shown that operating a fixed capacity plant in the floating cooling mode can generate significantly more electrical energy at a higher thermodynamic efficiency and reduced bus bar cost for approximately the same capital investment. Floating cooling is also shown to minimize the adverse influence on plant performance due to a declining resource temperature.

1047. GGIS-100528/O/ / /A/ / / / /

Title- The Time Dependent Behavior of Cores from the Pleasant Bayou Wells

Author(s)- / Thompson , T.W. / Jogi , P.N. / Gray , K.E. /
Richardson , J. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13 , 1981)

Publication date- 1981

Pagination- Page 83 , 5 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)
DE-AC08-79ET27112 /

Auxiliary expression(s)-
Illus. / Diagram (2) / Graph (7) /
Table
Ref.

Descriptor(s)- / Creep / Data / Gulf Coast / Models / Pleasant Bayou
No. 1 Well / Pleasant Bayou No. 2 Well / Sand / Texas / Time
dependence /

Abstract by Author

Results of constant-load creep tests on sands from the Pleasant Bayou wells are reported. Significant time dependent behavior under both hydrostatic and non-hydrostatic states of stress have been fit to linear rheological models. The data and models are reported.

1048. GGIS-100466/R/ / /M/ / / / /

Title- The Use of Geothermal Heat for Crop Drying and Related
Agricultural Applications

Subtitle- Final Report

Author(s)- / Gordon , Theodore J. / Wright , Thomas C. / Fein , Elihu
 / Munson , Thomas R. /
 Publication date- March 1978
 Pagination- 253 Pages
 Report/patent- IDO/1628-4
 Available- NTIS
 (Paper copy)
 (Microfiche)
 Local Availability- GGIS
 Sponsor- / Department of Energy, Idaho Falls, ID (USA). Idaho
 Operations Office
 E(10-1)-1628 /
 Corporate Author- Futures Group
 Glastonbury , CT , USA
 Auxiliary expression(s)-
 Illus. / Diagram (15) / Graph (21) / Map (3) /
 Table
 Ref.
 Descriptor(s)- / Agriculture / Capital / Case histories / Computer
 codes / Cost / Crops / Design / Direct energy utilization /
 Economic analysis / Engineering properties / Feasibility studies
 / Geographical distribution / Geothermal fluids / Geothermal
 heating / Government policies / Institutional aspects / Market /
 Models / Recommendations / Site selection /
 Abstract by Author (revised)

At least 2 * 10**13 btus are used each year for crop drying within 50 miles of identified hydrothermal resources. Alfalfa dehydration consumes a substantial portion of this energy. The coincidence between alfalfa growing areas and geothermal resources in the western United States is relatively large: about 1 million acres in the top 25 alfalfa producing counties. These observations led to the selection of the alfalfa dehydration industry for in-depth analysis of the application of moderate temperature geothermal heat. Six geothermal heat exchanger/dryer configurations were examined. Even in the most favorable scenario analysis shows that geothermal retrofitting would increase the price of the alfalfa "dehy" about 40 percent. Increased solar drying of alfalfa is the recommended method for saving energy. Use of geothermal heat for drying other crops may be more promising; this possibility was explored also. Agricultural processing applications other than drying were investigated briefly. Extraction of leaf protein from alfalfa could provide an important new source of human and animal food; moderate temperature geothermal heat could be used. The coincidence of geothermal resources within areas that produce large amounts of crop residues suggest that these residues could be processed for animal feed.

 1049. GGIS-100899/0/ / /A/ / / / /

Title- The Use of Program GEOTHM to Design and Optimize
 Geothermal Power Cycles

Author(s)- / Pines , H.S. / Green , M.A. /
 Conference- 11 Intersociety Energy Conversion Engineering Conference
 Pagination- Page 836 , 7 Pages
 Report/patent- SAE--769144

Geopressured Geothermal Bibliography

Corporate Author- California Univ., Berkeley
Lawrence Berkeley Lab.
Berkeley, California, USA

Auxiliary expression(s)-
Illus / Diagram (3) / Graph (3) /
Table
Ref.

Descriptor(s)- / Computer codes / Codes / Geothermal brines /
Mathematical models / Optimization / Thermodynamic cycles /
Working fluids /

Abstract by Author

The Lawrence Berkeley Laboratory program GEOTHM has been under development for nearly two years. GEOTHM will design and optimize a wide variety of thermodynamic cycles. The most recent improvements in the GEOTHM program are included in this paper. These improvements include: a model for concentrated saline brines and a single step cycle optimization process. Geothermal power cycles are given as examples.

1050. GGIS-100002/0/ / 2/A/ / / / /

Title- The Use of Subsurface Temperature to Detect Geopressure
(Applications in Louisiana)

Author(s)- / George, E. Rush /
Conference- Abnorm. Subsurf. Pressure
Baton Rouge
Louisiana
USA

Publication date- Vol. 2, 1970

Pagination- Page 5, 22 Pages

Auxiliary expression(s)-
Illus.

Descriptor(s)- / Louisiana / Engineering geology / Heat flow /
Geopressured reservoirs / United States / Geopressure / Gulf
Coast / Detection / Temperature / Measurement / Uses /

1051. GGIS-100407/0/ / /A/ / / / /

Title- Thermal Design Optimization of Industrial Processes When
Geothermal Energy is Available

Author(s)- / Mikic, Borivoje / Meal, Harlan C. /
Conference- Geothermal Resources Council Annual Meeting (Geothermal
Energy for the Eighties)
Salt Lake City
Utah
USA (September 9, 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4, 1980

Pagination- Page 593, 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council
P.O. Box 98

Davis
CA
95616
Local Availability- GGIS
Auxiliary expression(s)-
Table
Ref.
Descriptor(s)- / Algorithms / Computer codes / Cost / Design /
Economics / Efficiency / Equations / Geothermal energy / Heat
transfer / Mathematical models / Mathematics / Optimization /
Performance / Process heat / Thermal properties /
Abstract by GGIS
Thermal design of industrial process using a geothermal
energy resource requires an approach that recognizes the
peculiarities of that specific resource. Because the
characteristics of the hot fluid are resource dependent, these
characteristics must be built into the design of heat transfer
operations. Two methods are presented for finding the optimal
thermal design given a specific resource: an algorithmic
procedure, and a mathematical programming technique.

1052. GGIS-100020/O/ / 9/A/ / / / /

**Title- Thermodynamic Behavior and Production Forecast of High
Pressure and High Temperature Reservoirs Containing
Carbonated Natural Gases**

Author(s)- / Ban , A. / Balint , V. / Doleschall , S. / Turok , J. /
Conference- World Petroleum Congress
Publication date- Vol. 9 , Issue 4 , 1975
Pagination- Page 401 , 7 Pages
Auxiliary expression(s)-
Illus.
Sum.

Descriptor(s)- / Natural gas / Production / Thermodynamic properties
/ Chemical composition / Reservoir rocks / Thermodynamics /
Models / Geopressure /

1053. GGIS-100120/R/ / /M/ / / / /

Title- Thermodynamic Modeling of Geothermal Power Plants

Author(s)- / Walter , R. A. / Bloomster , C. M. / Wise , S. E. /
Publication date- May 1975
Pagination- Page 58
Report/patent- BNWL--1911
Available- NTIS

(Paper copy)
(Microform)

Corporate Author- Battelle Pacific Northwest Labs
Richland , Washington , USA

Descriptor(s)- / Binary cycles / Computer codes / Cost / Design /
Flashed steam systems / G codes / Geopressured systems /
Geothermal power plants / Geothermal systems / Mathematical
models / Operation / Optimization / Physical properties /

Geopressured Geothermal Bibliography

Simulation / Thermodynamic properties / Thermodynamics / Total
flow systems / Working fluids /
Abstract by NTIS

Different types of power plants for generating electricity from geothermal reservoirs have been proposed. A computer program has been constructed at Battelle-Northwest Laboratories to analytically model four different geothermal power plants for these applications. This program is one part of an overall geothermal system model called "GEOCOST". GEOCOST, a simulation model which calculates the cost of generating electricity from geothermal energy, is composed of two principal sections: a reservoir model which simulates the exploration, development, and operation of a geothermal reservoir, and a power plant model which simulates the design, construction, and operation of the power plant. Power plant modeling results are given in this report. (The power plant models include the flashed steam plant, binary fluid cycle plant, total flow plant, and the geopressured plant. For each of these plants, fluid mass flow rates, physical and thermodynamic state points, component sizes, and plant design performance are determined for a variety of geothermal fluid conditions. This computer model can be used to predict the optimum power plant types and operating conditions for use with a particular geothermal resource. Using the overall model, sensitivity analyses can be performed to determine the relative effect of different economic parameters, assumptions, and uncertainties on the cost of generating electricity.

1054. GGIS-100528/O/ / /A/ / / / /

Title- Three Dimensional Seismic Investigation of the
Geopressured-Geothermal Reservoir at Parcperdue, Louisiana

Subtitle- Direct Detection of Production Volume

Author(s)- / Kinsland, Gary L. /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 289, 4 Pages

Local Availability- GGIS

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)
DE-AC08-80NV10185 /

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (1) / Map (1) /
Ref.

Descriptor(s)- / Geopressured reservoirs / L.R. Sweezy No. 1 Well /
Louisiana / Production / Reservoir properties / Seismic surveys
/ Volume /

Abstract by Author

Two three dimensional (3-D) seismic surveys are to be performed to investigate the geopressured-geothermal reservoir of the Dow/DOE Sweezy No. 1 well, Parcperdue Louisiana. 3-D surveys are superior to 2-D surveys for reasons of positioning of reflections on displays, availability of data surfaces and decreased interference of data. Two surveys are to be performed and specially processed to detect the actual volume of the

reservoir which yields fluids upon production. Part of the special processing is subtraction of the first survey, pre-production, from the second survey, post production. If successful, these techniques promise to aid the industry in efficient production of geopressured-geothermal reservoirs.

1055. GGIS-100296/J/ / /A/ / / / /

Title- Tomorrow's Fuels Will be Less Efficient

Author(s)- / Chiang, S.H. / Klinzing, G.E. / Cobb, J.T. /

Journal- Hydrocarbon Process

Publication date- Vol. 57, Issue 11, November 1978

Pagination- Page 209, 3 Pages

Corporate Author- Pittsburgh Univ.
Pittsburgh, Pennsylvania, USA

Auxiliary expression(s)-

Illus. / Figure (2) /

Table

Ref.

Descriptor(s)- / Energy consumption / Energy yield / Geopressure resources / Geothermal resources / Oil shale / Power generation / Power plants / Power potential / Solar energy /

Abstract by PROMPT

Future alternate fuel systems may not be efficient, according to S. H. Chiang, G. E. Linzing, and J. T. Cobb of University of Pittsburgh. A common feature of the future energy resources, oil shale, geothermal-geopressured reservoirs and solar energy, is their need for large external energy subsidies in terms of material, machines and mechanical power. When compared with the conventional energy resources, several observations can be made. Liquid fuels derived from oil shale are far less energy efficient than those derived from petroleum. Gas produced from geothermal-geopressured reservoirs needs much more external energy subsidy than gas from natural gas wells. Electricity generation, based on proposed solar and geothermal systems, has an overall energy efficiency of 5-10%, vs the higher level in direct-fossil-fuel-fired power plants. However, solar and geothermal systems are comparable in performance with synthetic fuel derived from coal. Roof-top solar heating has an energy efficiency of 70%, which compares favorably with the conventional home heating system using natural gas or oil.

1056. GGIS-100158/R/ / /M/ / / / /

Title- Total Energy Recovery System for Agribusiness

Subtitle- Final Report

Author(s)- / Fogelman, Sam F. / Fisher, Leonard A. / Black, Allan R. / Singh, Dev P. /

Publisher- ERDA
Washington, D. C.

Publication date- May 1977

Pagination- 68 Pages

Report/patent- SAN/1327-2

Available- NTIS

Geopressured Geothermal Bibliography

(Paper copy)
(Microfiche)
Sponsor- / ERDA
EY-76-C-03-1327 /
Auxiliary expression(s)-
Illus. / Diagram (8) / Map (1) /
Table
Ref.
Descriptor(s)- / Aquaculture / Biomass / Cultivation techniques /
Direct energy utilization / Greenhouses / Heat exchangers / Hot
water systems / Scaling / Total energy systems /
Abstract by ERA

An engineering and economic study was made to determine a practical balance of selected agribusiness subsystems resulting in realistic estimated produce yields for a geothermally heated system known as the Total Energy Recovery System for Agribusiness. The subsystem cycles for an average application at an unspecified hydrothermal resources site in the western United States utilize waste and by-products from their companion cycles insofar as practicable. Based on conservative estimates of current controlled environment yields, produce wholesale market prices, production costs, and capital investment required, it appears that the family-operation-sized TERSA module presents the potential for marginal recovery of all capital investment costs. In addition to family- or small-cooperative-farming groups, TERSA has potential users in food-oriented corporations and large-cooperative-agribusiness operations. The following topics are considered in detail: greenhouse tomatoes and cucumbers; fish farming; mushroom culture; biogas and heat exchanger selection; and the system.

1057. GGIS-100001/J/ / 2/A/ // //

Title- Trapping Mechanisms for Oil in Lower Cretaceous Muddy Sandstone in Recluse Field, Wyoming

Author(s)- / Berg , R. R. /
Conference- Soc. Econ. Paleontol. Mineral. Annu. Mtg.
Publisher- Am. Assoc. Petr. Geol.
Publication date- 1975
Pagination- Page 3

1058. GGIS-100224/B/ / /A/ // //

Title- Trend Areas and Exploration Techniques

(In Geology of Alternate Energy Resources in the South-Central United States)

Subtitle- Subsurface Techniques for Locating and Evaluating Geopressured Geothermal Reservoirs Along the Texas Gulf Coast

Author(s)- / Bebout , D. G. /
Publisher- Houston Geological Society
Houston, Texas
Publication date- 1977
Pagination- Page 251 , 23 Pages
Available- Geothermal Information Services

318 Cherrywood St.
West Covina
CA
91791)

Descriptor(s)- / Depositional environment / Exploration methods /
Formation thickness / Frio Formation / Geopressure exploration /
Geopressured reservoirs / Geopressured zones / Gulf Coast /
Resource evaluations / Sand / Sand trends / Texas /

Abstract by TIC

A high percentage of the Texas Gulf Coast oil and gas is produced from the Frio Formation; most of the hydrocarbons are derived from fluvial sands on the updip portion of the Frio Sedimentary wedge and are less than 100 feet thick. The downdip Frio sands are considerably thicker 100 to 700 feet (31 to 214 M) and were deposited either as deltas or as strandplain deposits. These thick sands at depths greater than 10,000 feet commonly produce water fresher than sea water with temperatures between 250 to 300 DEG F (122 to 150 DEG C) and are saturated with methane gas. The objective of this project is to evaluate the potential of producing water from these large geopressured reservoirs in order to obtain thermal energy, methane gas, and potable water. The first essential step in such an evaluation is to determine regional trends of the sand bodies and their depositional environments. Sand-percent maps of the lower part of the Frio outline thick dip-oriented sand bodies which were deposited as high-constructive deltas along the lower Texas Gulf Coast. To the north, along the middle and upper Texas Gulf Coast, sands along the main sand depocenter are strike-aligned and were deposited as strandplain sands and barrier bars. The sands of the upper part of the Frio, on the other hand, are predominantly strike-oriented throughout the Texas Gulf Coast. Sand-percent maps along with isothermal maps identify gross geothermal fairways which contain sand bodies greater than 300 DEG F (122 DEG C). More detailed studies of these fairways, then, incorporate both detailed analysis of sand distribution with closely spaced well-logs and porosity and permeability data obtained from core analysis and log interpretation.

1059. GGIS-100178/J/ / /A/ / / / /

Title- Trends in the Development of Heat and Power Production

Author(s)- / Jurisch, J. /

Journal- Energie

Publication date- Vol. 26 , Issue 10 , 1974

Pagination- Page 291 , 6 Pages

Language- German

Descriptor(s)- / Coal reserves / Energy consumption / Energy sources /
Forecasting / Geopressured systems / Geothermal energy /
Hydroelectric power / Natural gas deposits / Ocean thermal
energy conversion / Petroleum deposits / Reviews / Solar energy /
Tidal power /

Abstract by DOE/RECON

A survey is made of the present state of energy consumption and estimates are made of future demand. Both conventional and new energy sources are discussed. It is predicted that no major shortage of energy will occur within the next century. The

total reserves of petroleum and natural gas are estimated to be 3.46×10^{11} and 2.33×10^{11} tons (coal equivalent), respectively. The western hemisphere is believed to be essentially independent of the eastern hemisphere with regard to natural gas. New sources of coal, ranging from anthracite to lignite, are continuously being discovered in previously unsurveyed countries. Production of coal, however, continues to decline. New energy sources which may be considered to be essentially renewable and environmentally clean are hydrodynamic power, tidal energy, ocean thermal gradients, geopressured energy, solar energy, and geothermal energy. The potential output of geothermal energy is estimated to be 2.0×10^{13} tons (coal equivalent). The geothermal energy potential of the U.S.A. as of 1985 is predicted to be about 400 GW.

1060. GGIS-100995/ / / /A/ / / / /

Title- Turbine Testing in Direct Contact Binary Loop

Author(s)- / Nichols, K.E. / Lobach, J.L. / Hunt, J.W. /

Publication date- Vol. 2, Issue 2, 1978

Pagination- Page 499, 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Barber-Nichols Engineering Co.

Arvada, Colorado, USA

Auxiliary expression(s)-

Table

Illus. / Diagram (1) / Graph (2) /

Ref.

Descriptor(s)- / Binary cycles / Equipment / Geothermal brines / Heat exchangers / Power generation / Scaling / Testing / Turbines / 2-methylpropane /

Abstract by Author

The turbine power loop test program successfully demonstrated the production of electricity from a geothermal source using isobutane in a direct contact heat exchanger. The tests were completed at the East Mesa Component Test Facility utilizing brine from well Mesa 6-2. The turbo-generator unit consists of an axial flow, partial admission turbine, a gearbox, and a 60 KW 3600 rpm KATO generator. These components, along with controls and safety features, were mounted on a common skid. The turbine was calibrated on pure isobutane at subcritical and supercritical turbine inlet conditions. The IC (sub 4) was heated using a conventional tube and shell heat exchanger. An endurance run of 500 hours was then completed using an existing direct contact heat exchanger loop designed and operated by DSS Engineers of Ft. Lauderdale, Florida. At the conclusion of this testing, the turbine, connecting pipes, and a portion of the direct contact heat exchanger were disassembled and inspected for evidence of scaling or erosion in the test hardware. The only scale deposition noted was in the turbine nozzles and

blading. The remainder of the loop was in good condition and gave no evidence of distress which would prevent continued operation of the test loop. The scale formed on the nozzles and blading was shown to be primarily silicate by analysis. It was felt that liquid brine carryover was occurring. A demister component was added between the DCHX and the turbine and a subsequent 105 hour run showed insignificant scaling in the turbine.

1061. GGIS-100215/J/ / /A/ / / / /

Title- Two Examples of Overpressure Prediction and Detection Based on Seismic Data

Author(s)- / Djurasek , S. / Baric , F. /

Journal- Geophys. Prospect.

Publication date- Vol. 25 , Issue 3 , 1977

Pagination- Page 595 , 2 Pages

Descriptor(s)- / Seismic prospecting / Yugoslavia / Bangladesh /
Detection / Geopressure / Geopressure exploration / Seismic
detection /

1062. GGIS-100295/J/ / /A/ / / / /

Title- Two-Phase Flow in Geopressured Geothermal Wells

Author(s)- / Garg , S.K. / Pritchett , J.W. /

Journal- Energy Convers.

Publication date- Vol. 18 , Issue 1 , 1978

Pagination- Page 45 , 7 Pages

Corporate Author- Systems, Science and Software
La Jolla , California , USA

Auxiliary expression(s)-

Ref.

Illus. / Graph (6) / Map (2) /
Table

Descriptor(s)- / Aquifers / Compressibility / Depth / Flow Rate / Gas
Production / Geopressured Wells / Mathematical Models / Methane
/ Permeability / Reservoir Temperature / Two Phase Flow / Water
Production /

Abstract by Compendex

The production characteristics of two-phase (free methane and liquid water with dissolved methane) geopressured geothermal wells are analyzed. The fluid flow in the aquifer is treated as single-phase (liquid water with dissolved methane) unsteady radial Darcian flow; two-phase flow is assumed to occur only in the cased part of the production hole. The mathematical model allows for different gas and liquid velocities in the two-phase regime. Sample calculations illustrate the effects on production of aquifer permeability and compressibility, the depth of the geopressured aquifer, the reservoir temperature, and the dissolved methane content of the aquifer fluids.

1063. GGIS-100442/R/ / /M/ / / / /

Title- THERRP

Subtitle- A Thermodynamic Properties Program

Author(s)- / Deeds , R. S. /

Publication date-

Pagination- 106 Pages

Report/patent- TREE-1081

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
Geothermal Energy
EY-76-C-07-1570

Sponsor- / Department of Energy, Idaho Falls (USA). Idaho Operations
Office
EY-76-C-07-1570 /

Corporate Author- EG and G Idaho, Inc.
Idaho Falls , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Figure (6) /

Table

Ref.

Descriptor(s)- / Computer calculations / Computer codes /
Documentation / Enthalpy / Hydrocarbons / Pressure / Temperature
/ Thermodynamic properties /

Abstract by Author

This report documents the computer program THERPP, a program that calculates the thermodynamic properties of light hydrocarbons and mixtures of light hydrocarbons. A specific pressure-temperature or pressure-enthalpy grid is input to obtain properties in the desired region. THERPP is a modification of the program HSGC. Thermodynamic properties are calculated using Starling's modification to the Benedict-Webb-Rubin equation of state.

1064. GGIS-100037/J/ /17610/A/ / / / /

Title- U.S. Geothermal Resources

(No Panacea, but Potential for Additional Energy)

Journal- Eng. Min. J.

Publication date- Vol. 176 , Issue 10 , 1975

Pagination- Page 29 , 2 Pages

Descriptor(s)- / Power generation / Forecasting / California /
Geopressured systems / Temperature measurement /

1065. GGIS-100058/J/ / 7247/A/ / / / /

Title- U.S. Geothermal, Geologic Patterns Compared

Author(s)- / Shelton , J. W. / Horn , M. K. / Lassley , R. H. /

Journal- Oil and Gas Journal

Publication date- Vol. 72 , Issue 47 , 1974
 Pagination- Page 173 , 2 Pages
 Descriptor(s)- / Texas / Wells / Heat flow / Regional geology / Maps /
 Gravity surveys / Geothermal gradients /
 Abstract by GGIS
 Geothermal trends and patterns in West and South Texas and their correlation with regional structural and gravity trends are examined and compared, generally, with characteristics of the U.S. Data was obtained from geothermal gradient map data collected by the Geothermal Survey of North America (GSNA).

1066. GGIS-100100/R/ / /M/ / / / /

Title- U.S. Gulf Coast Geopressured Geothermal Reservoir Simulation
 (Final Report)
 Author(s)- / Garg , S. K. / Pritchett , J. K. / Rice , M. H. / Riney , T. D. /
 Publication date- 1977
 Pagination- 112 Pages
 Report/patent- SSS-R-77-3147
 Corporate Author- Systems, Science, and Software
 La Jolla , California , USA
 Descriptor(s)- / Fluid flow / Theoretical treatments / Injection wells / Water-methane mixtures / Non-condensibles / Water / Density / Louisiana / Texas / Geopressures systems / Tables / Diagrams / Maps / Thermodynamic properties / Mathematical models / Computer calculations /

1067. GGIS-100407/O/ / /A/ / / / /

Title- U.S. GAO Studies of Geothermal Energy
 Author(s)- / Finn , Donald F.X. /
 Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
 Salt Lake City
 Utah
 USA (September 9 , 1980)
 Publisher- Geothermal Resources Council
 Davis, CA
 Publication date- Vol. 4 , 1980
 Pagination- Page 775 , 4 Pages
 Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
 Manager: Vasel W. Roberts
 Available- Geothermal Resources Council
 P.O. Box 98
 Davis
 CA
 95616
 Local Availability- GGIS
 Auxiliary expression(s)-
 Ref.
 Descriptor(s)- / Cost / Development / Exploitation / Financial incentives / Financing / Geothermal energy / Government policies

Geopressured Geothermal Bibliography

/ Investment / Land leasing / Leases / Legislation / Regulations
/ Taxes /

Abstract by GGIS

Three reports on geothermal energy that were issued by the U.S. GAO are summarized in this article. The reports, "How to Speed Development of Geothermal Energy on Federal Lands", "Geothermal Energy: Obstacles and Uncertainties Impede Its Widespread Use", and "The Geothermal Loan Guaranty Program: Need for Improvements", are important for their analysis and recommendations. Important also is their glaring failure to include any discussion of certain tax and economic issues of interest to the private sector.

1068. GGIS-100561/R/ / /M/ / / / /

Title- Unconventional Gas Recovery Program

(Semi-Annual Report for the Period Ending September 30, 1979)

Author(s)- / Manilla , R.D. /

Publication date- April 1980

Pagination- 477 Pages

Report/patent- DOE/METC/SP-2

Available- NTIS

Sponsor- / Department of Energy, Washington, D.C. (USA) /

Corporate Author- Department of Energy

Morgantown Energy Technology Center

Morgantown , WV , USA

Descriptor(s)- / Gases / Research programs / Technology assessment /
US DOE /

Abstract by NTIS

This document is the third semi-annual report describing the technical progress of the U.S. DOE projects directed at gas recovery from unconventional sources. Currently the program includes Methane Recovery from Coalbeds Project, Eastern Gas Shales Project, Western Gas Sands Project, and Geopressured Aquifers Project.

1069. GGIS-100509/R/ / /M/ / / / /

Title- Unconventional Gas Recovery Program

Subtitle- Semi-Annual Report for the Period Ending March 31, 1979

Author(s)- / Wise , R. L. /

Publication date- August 1979

Pagination- 375 Pages

Report/patent- METC/SP-79/8

Available- NTIS

(Paper copy)

(Microfiche)

Corporate Author- Department of Energy

Morgantown Energy Technology Center

Morgantown , WV , USA

Descriptor(s)- / Aquifers / DOE / Geopressured reservoirs / Methane /
Recovery processes / Research programs / Sand / Shale /

Abstract by NTIS

This document is the second semi-annual report describing the technical progress of the US DOE projects directed at gas recovery from unconventional sources. Currently the program includes: Methane Recovery from Coalbeds Project, Eastern Gas Shales Project, Western Gas Sand Project, and Geopressured Aquifers Project. This report is divided into five parts: a summary (Section 1), and a section devoted to each resource (Sections 2 through 5). Each resource section presents information which serves as an introduction to that project.

1070. GGIS-100507/R/ / /M/ / / / /

Title- Unconventional Gas Sources

Subtitle- Executive Summary

Pagination- 50 Pages

Report/patent- DOE/TIC-11417

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA) /

Corporate Author- National Petroleum Council

Washington, DC, USA

Descriptor(s)- / Brines / Economics / Energy demand / Energy reserves / Geopressured systems / Natural gas deposits / USA /

Abstract by NTIS

The long lead time required for conversion from oil or gas to coal and for development of a synthetic fuel industry dictates that oil and gas must continue to supply the United States with the majority of its energy requirements over the near term. In the interim period, the nation must seek a resource that can be developed quickly, incrementally, and with as few environmental concerns as possible. One option which could potentially fit these requirements is to explore for, drill, and produce unconventional gas: Devonian Shale gas, coal seam gas, gas dissolved in geopressured brines, and gas from tight reservoirs. This report addresses the significance of these sources and the economic and technical conditions under which they could be developed.

1071. GGIS-100492/R/ / /M/ / / / /

Title- Unconventional Gas Sources

Subtitle- Characterization and Assessment

Author(s)- / Yates, J. H. /

Publication date- October 1979

Pagination- 184 Pages

Report/patent- PB-218993

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / Gas Research Inst., Chicago, IL (USA)

GRA-5011-310-0110 /

Corporate Author- Bechtel, Inc.

Geopressured Geothermal Bibliography

San Francisco , CA , USA

Descriptor(s)- / Coal deposits / Energy resources / Energy sources /
Methane / Natural gas / Resource assessment / Shale / USA /

Abstract by NTIS

This report assesses available information on each of the major unconventional natural gas sources: coal bed methane, geopressurized methane, eastern gas shales, and western gas shales. Each is appraised for quantity, location, disposition, character, quality, and producibility.

1072. GGIS-100237/J/ / /A/ / / / /

Title- Unconventional Gas Supply Options

Author(s)- / Sarkes , Louis A. / Nicholls , John /

Journal- Am. Gas. Assoc. Mon.

Publication date- Vol. 60 , Issue 1 , January 1978

Pagination- Page 25 , 6 Pages

Auxiliary expression(s)-

Illus. / Graph (1) / Photo (3) /

Table

Ref.

Descriptor(s)- / Availability / Energy source development / Energy
supplies / Geopressure resources / Natural gas / Natural gas
deposits / Resource assessment /

Abstract by EIC

Future gas supplies, under the proper regulatory and economic conditions, can be developed in a time frame that can assure the U. S. with a constant and adequate supply for many years. Gas from waste materials, bioconversion research, determination of development parameters, SNG from coal, HYGAS, carbon dioxide acceptors, BIGAS, steam-iron hydrogen, SNG from oil shale, geopressured water zones, production past 1985, and SNG from biomass are discussed. Though the potential supply of unconventional gas exceeds both proved reserves and potential resources of conventional gas, little research has been done to develop them. At a consumption rate of 20 TCF/YR, there are from 35-65 years of conventional gas supply remaining to be produced.

1073. GGIS-100407/O/ / /A/ / / / /

Title- Unitary Water Source Heat Pumps for Geothermal Applications

Author(s)- / Reistad , Gordon M. / Means , Paul /

Conference- Geothermal Resources Council Annual Meeting (Geothermal
Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 601 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (1) / Graph (7) /

Ref.

Descriptor(s)- / Comparative evaluations / Design / Equipment /
Geothermal energy / Geothermal resources / Heat exchangers /
Heat transfer / Performance / Physical properties / Residential
buildings / Space heating / Temperature dependence /

Abstract by GGIS

Redesigning the residential heat pump unit so it withstands the high temperatures of a geothermal energy resource offers a realistic method for determining the true potential for geothermal heating in the residential sector. Current retail heat pump units indicate a geothermal energy potential based only on a portion of the geothermal resource temperature range; using these figures underestimates the true potential for geothermal heating. Redesigning the heat pump unit has produced calculations from which a true estimate can be obtained.

1074. GGIS-100075/ / / /M/ / / / /

Title- United States Gulf Coast Geopressured Geothermal Management
and Scope-of-Work Study for Generation of Electrical Power

Publication date- Vol. 5

Note- Sec 2. Geopressured Geothermal Energy Conference 500

Sponsor- / U. S. ERDA

(40-1) 4900 /

1075. GGIS-100327/R/ / /M/ / / / /

Title- United States Gulf Coast Geopressured Geothermal Program
(Final Report for the Period 1 October 1977 - 30 November 1978)

Subtitle- Special Projects Research and Coordination Assistance

Author(s)- / Dorfman , Myron H. / Bebout , D.G. /

Publication date- April 1979

Pagination- 124 Pages

Report/patent- ORO-5243-T1

Available- NTIS

(Paper Copy)

(Microfiche)

Local Availability- CES

Sponsor- / U.S. Department of Energy

EY-76-S-05-5243 /

Auxiliary expression(s)-

Illus. / Figure (1) /

Table

Appendix

Geopressured Geothermal Bibliography

Descriptor(s)- / Drilling / Geopressure exploration / Geopressured reservoirs / Legal aspect / Research programs / Resource assessment / Texas / Well completion / Well logging /

Abstract by Author

The United States Gulf Coast Geopressured Geothermal Program Special Projects Research and Coordination Assistance contract calls for the Center for Energy Studies and the Bureau of Economic Geology at UT Austin to assist DOE/DGE in the orderly development of the potential geopressured geothermal resource in the Gulf Coast region. In general, this coordination assistance function takes the form of providing liaison with various industrial components that participate in the program and with state and local agencies. This document contains a report of the activities of the UT research group in the areas of coordination and assistance as performed under this contract. The material is grouped by activities as described in the proposal from which the contract was generated.

1076. GGIS-100544/R/ / /M/ / / / /

Title- United States Gulf Coast Geopressured Geothermal Resource Management and Scope-of-Work Study for Generation of Electric Power

(Unsolicited research proposal submitted to the National Science Foundation)

Publication date- 1975

Pagination- 110 Pages

Local Availability- CES

Corporate Author- Texas Univ.

Center for Energy Studies

Austin, USA

Descriptor(s)- / Electric power / Energy conversion / Feasibility / Geopressured reservoirs / Geothermal fluids / Gulf Coast / Planning / Power generation / Process heat / Research programs /

Abstract by Author (revised)

The ever increasing demand for energy has resulted in increased interest in the use of geothermal energy for electric power generation in this country. A unique form of potential energy exists at varying depths in geopressured aquifers underlying the United States Gulf Coast. In order to determine the feasibility of the utilization of the Gulf Coast geothermal fluids, it is necessary to identify the scope of the research and development which will lead to the full utilization of this geothermal resource. This document delineates the scope of the initial phase of a proposal to perform a management and scope-of-work study to establish the scientific, technical, and economic feasibility of converting one form of geothermal energy, presently underdeveloped, into electrical energy or process heat.

1077. GGIS-100241/O/ / /A/ / / / /

Title- Unitization for Geothermal Resources

Subtitle- United We Save

Author(s)- / Goldstein , D. B. /
 Conference- Geothermal Resources Development Institute Conference
 Salt Lake City
 Utah
 USA (January 27 , 1977)
 Publisher- Rocky Mountain Mineral Law Foundation
 Boulder, CO
 Publication date- January 27 , 1977
 Pagination- 40 Pages
 Report/patent- CONF-770135--
 Descriptor(s)- / Energy source development / Efficiency / Geothermal
 resources / Geysers Geothermal Field / Legal aspects / Reservoir
 models / Unitization /
 Abstract by TIC
 The following subjects are discussed: a reservoir model,
 unitization applied to the geothermal model, maximizing total
 energy recovery through unitized operations, maximizing the
 economic use of recovered geothermal energy, prevention of the
 drilling of unnecessary wells, the need for drilling units,
 protection of correlative rights, allocation of unit production,
 "stand-by" wells, injection, rights-of-way, statutory law
 applicable to geothermal unitization in California, practical
 obstacles to voluntary unitization, and the need for compulsory
 geothermal unitization. (MHR)

 1078. GGIS-100240/J/ / /A/ / / / /

Title- Unitization for Geothermal Resources

Subtitle- United We Save

Author(s)- / Goldstein , Dennis B. /

Journal- Land Water Law Review

Publication date- Vol. 13 , Issue 1 , 1977

Pagination- Page 159 , 28 Pages

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Energy source development / Efficiency / Geothermal
 resources / Geysers Geothermal Field / Unitization /

Abstract by EIC

The lack of unitization or pooling at the Geysers Geothermal
 Field in California should not be construed as an indication that
 such cooperative development is unnecessary or lacks utility.
 Unitization is applied to the geothermal model of the Geysers
 reservoir. Benefits of unitized operations would be as valuable
 in the geothermal context as in the oil and gas context. Timely
 enactment of compulsory unitization schemes is necessary to
 prevent unnecessary inefficiency and waste in the geothermal
 industry.

 1079. GGIS-100407/O/ / /A/ / / / /

**Title- Upgrading Amerada Type Survey Clocks for High Temperature
 Geothermal Service**

Author(s)- / Major , Bruce H. / Witten , Clifford L. /

Geopressured Geothermal Bibliography

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
Salt Lake City
Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council
Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 361 , 4 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasei W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Diagram (3) /

Ref.

Descriptor(s)- / Design / Elevated temperature / Failures / Field studies / Geothermal industry / Geothermal wells / Laboratory studies / Measuring instruments / Mechanical properties / Physical properties / Reliability / Subsurface temperature / Well logging /

Abstract by GGIS

The "Amerada-type" survey clocks originally were intended for use in the oil and gas industries. Use of these subsurface gauges has been extended into the geothermal industry, but because of the high temperatures associated with geothermal production, the gauges have had a significant failure rate. Failure occurs primarily when the high temperatures cause the spring driven mechanical clocks to stop or lock. This project was undertaken to upgrade the survey clocks to a capacity of at least 300 deg C. Performance has improved with the introduction of design modifications and special lubricants for the moving parts. Results show performance to be reliable in laboratory tests as well as in actual geothermal wells at temperatures to 330 deg C.

1080. GGIS-100506/R/ / /M/ / / / /

Title- Use of Data from Core Tests in the Design and Operation of Spent Brine Injection Wells in Geopressured or Geothermal Systems

Author(s)- / Jorda , R. M. /

Publication date- March 1980

Pagination- 156 Pages

Report/patent- SAND-80-7047

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

AC04-76DP00789 /

Corporate Author- Completion Technology Co.

Houston , TX , USA

Descriptor(s)- / Brines / Clay / Data / Engineering / Geopressured systems / Geothermal systems / Injection wells / Lithology / Permeability / Porosity / Shale /

Abstract by NTIS

The effects of formation characteristics on injection well performance are reviewed. Use of data acquired from cores taken from injection horizons to predict injectivity is described. And methods for utilizing data from bench scale testing of brine and core samples to optimize injection well design are presented. Currently available methods and equipment provide data which enable the optimum design of injection wells through analysis of cores taken from injection zones. These methods also provide a means of identifying and correcting well injection problems. Methods described in this report are: bulk density measurement; porosity measurement; pore size distribution analysis; permeability measurement; formation grain size distribution analysis; core description (lithology) and composition; amount, type and distribution of clays and shales; connate water analysis; consolidatability of friable reservoir rocks; grain and pore characterization by scanning electron microscopy; grain and pore characterization by thin section analysis; permeability damage and enhancement tests; distribution of water-borne particles in porous media; and reservoir matrix acidizing effectiveness. The precise methods of obtaining this information are described, and their use in the engineering of injection wells is illustrated by examples, where applicable.

1081. GGIS-100066/J/ /18201/A/ // //

Title- Use of Seismic Data Can Cut Arctic Drilling Costs

Author(s)- / Dumont , A. E. / Purdy , V. S. /

Journal- World Oil

Publication date- Vol. 182 , Issue 1 , January 1976

Pagination- Page 71 , 4 Pages

Descriptor(s)- / Arctic regions / Cost / Drilling / Drilling fluids / Drilling rigs / Equipment / Geopressured systems / Oil wells / Petroleum / Seismic surveys / Velocity / Well drilling /

Abstract by ERDA/RECON

In the frontier drilling areas, geophysical data are important tools in that information from offset wells is seldom available. By using seismic interval velocity profiles, Gulf Oil Canada has been able to predict troublesome drilling areas and abnormally high pressures in addition to reducing drilling costs through better utilization of bits and casing.

1082. GGIS-100407/O/ / /A/ // //

Title- Use of Sequential Method in Geothermal Reservoir Simulation

Author(s)- / Cheng , M. C. / Crichlow , H. B. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal Energy for the Eighties)
Salt Lake City

Geopressured Geothermal Bibliography

Utah
USA (September 9 , 1980)
Publisher- Geothermal Resources Council
Davis, CA
Publication date- Vol. 4 , 1980
Pagination- Page 317 , 4 Pages
Note- Subcontract 852-0030 KX to Rockwell International EPRI Project
Manager: Vasel W. Roberts
Available- Geothermal Resources Council
P.O. Box 98
Davis
CA
95616

Local Availability- GGIS

Auxiliary expression(s)-

Illus. / Graph (1) /

Table

Ref.

Descriptor(s)- / Calculation methods / Computer calculations /
Computerized simulation / Differential equations / Equations /
Geothermal reservoirs / Geothermal systems / Mathematical models
/ Mathematics / Models / Numerical analysis / Numerical solution
/ Production / Simulation / Subsurface reservoirs /

Abstract by GGIS

This work on a two dimensional reservoir simulator improves on the current solution technique for simulator equations, that of direct simultaneous solution. When the reservoir grid is large, the direct simultaneous method is highly inefficient. In response to this need for greater efficiency, a two dimensional (x - y) finite difference computer geothermal reservoir simulator (CGS) with a solution technique based on the sequential numerical methods used in petroleum reservoir simulation has been developed. A description of the development and application of this CGS is provided in this paper.

1083. GGIS-100407/O/ / /A/ / / / /

Title- User Coupled Confirmation Drilling Program

Author(s)- / Gray , Robert A. / Prestwich , Susan M. / Wright ,
Phillip M. / Dolenc , Max R. /

Conference- Geothermal Resources Council Annual Meeting (Geothermal
Energy for the Eighties)

Salt Lake City

Utah

USA (September 9 , 1980)

Publisher- Geothermal Resources Council

Davis, CA

Publication date- Vol. 4 , 1980

Pagination- Page 783 , 3 Pages

Note- Subcontract 852-0030 KX to Rockwell International EPRI Project

Manager: Vasel W. Roberts

Available- Geothermal Resources Council

P.O. Box 98

Davis

CA

95616

Local Availability- GGIS

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of Geothermal Energy /

Auxiliary expression(s)-

Illus. / Graph (2) /

Table

Ref.

Descriptor(s)- / Commercialization / Cost / Development / Direct energy utilization / Drilling / Exploitation / Geothermal exploration / Hydrothermal systems / Planning / Reservoir engineering / Site selection / US DOE /

Abstract by GGIS

The User-Coupled Confirmation Drilling Program, sponsored by the DOE's Division of Geothermal Energy, is part of the development plan to reach a nationwide hydrothermal direct heat production of 1.0 quad by the year 2000. Under the auspices of this program competitively selected projects will receive a percentage of their costs of exploration, drilling, flow testing, reservoir engineering and injection well drilling. The program scenario is described in this article, and its activities to date are summarized.

1084. GGIS-100154/0/ / /A/ / / / /

Title- Using Salton Sea Geothermal Brines for Electrical Power

Subtitle- A Review of Progress in Chemistry and Materials Technology, 1976 Status

Author(s)- / Tardiff, George E. /

Conference- Intersociety Energy Conversion Engineering Conference Washington, D. C. (August 28 , 1977)

Publication date- May 31 , 1977

Pagination- 12 Pages

Report/patent- CONF-770804-8

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / ERDA

W-7405-ENG-48 /

Corporate Author- California University, Livermore

Lawrence Livermore Laboratories

Livermore, California, USA

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (5) / Photo (8) /

Table

Ref.

Descriptor(s)- / Chemical composition / Corrosion resistance / Flashing / Geothermal brines / Materials testing / PH adjustment / Precipitation / Salton Sea / Scaling / Scaling control / Total flow systems /

Abstract by Author

Geothermal energy development research at the Lawrence Livermore Laboratory through 1976 has been aimed at solving the problems associated with the use of high-temperature, high-salinity brines found in the Salton Sea Geothermal Field for their practical conversion to electrical energy. Specifically, part of the program has been oriented toward

Geopressured Geothermal Bibliography

solving the problems of scale and solids deposition and corrosion of system components that are exposed to the highly mineralized brines. Brine acidification was found to be a promising method for controlling scale and solids deposition. Titanium, zirconium, and chromium-molybdenum alloys were shown to be the best economical corrosion-resistant materials for use in various parts of a total-flow turbine system. Scale and solids control and materials tests for conversion systems based on brine flashing are currently being evaluated. Some initial results and test plans are discussed.

1085. GGIS-100454/R/ / /M/ / / / /

Title- Using Salton Sea Geothermal Brines for Electrical Power:

(1976 Status)

Subtitle- A Review of Progress in Chemistry and Materials Technology

Author(s)- / Tardiff, George E. /

Conference- 12th Intersociety Energy Conversion Engr. Conf.

Washington, D.C.

USA (August 28 , 1977)

Publication date- May 31 , 1977

Pagination- 10 Pages

Report/patent- UCRL-79468

Note- Preprint

Available- Lawrence Livermore Laboratory

University of California

Livermore

CA

94550

(Paper copy)

Local Availability- CES

Corporate Author- California Univ.

Lawrence Livermore Lab.

Livermore , USA

Auxiliary expression(s)-

Illus. / Diagram (2) / Graph (5) / Photo (8) /

Table

Ref.

Descriptor(s)- / Chemistry / Comparative evaluations / Corrosion /
Corrosion resistant alloys / Deposition / Electric power /
Energy source development / Geothermal brines / Materials
testing / pH adjustment / Power generation / Precipitation /
Salton Sea / Scaling / Scaling control / Technology assessment /
Total flow systems /

Abstract by Author

Geothermal energy development research at the Lawrence Livermore Laboratory through 1976 has been aimed at solving the problems associated with the use of high-temperature, high-salinity brines found in the Salton Sea Geothermal Field for their practical conversion to electrical energy. Specifically, part of the program has been oriented toward solving the problems of scale and solids deposition and corrosion of system components that are exposed to the highly mineralized brines. Brine acidification was found to be a promising method for controlling scale and solids deposition.

Titanium, zirconium, and chromium-molybdenum alloys were shown to be the best economical corrosion resistant materials for use in various parts of a total-flow turbine system. Scale and solids control and materials tests for conversion systems based on brine flashing are currently being evaluated. Some initial results and test plans are discussed.

1086. GGIS-100532/O/ / /A/ / / / /

Title- Utility Company Views of Geothermal Development

Author(s)- / Hinrichs , Thomas C. /

Conference- Conference on Research for the Development of Geothermal Energy Resources
Pasadena

CA (September 23 , 1974)

Publication date- December 31 , 1974

Pagination- Page 345 , 4 Pages

Local Availability- GGIS

Descriptor(s)- / Electric power industry / Energy source development
/ Geothermal industry / Hazards / Public utilities / Risk assessment /

Abstract by (Unknown)

The utility industry would like to reduce the risks associated with rapid geothermal development. Suggestions for identifying and minimizing risks are given.

1087. GGIS-100995/ / / /A/ / / / /

Title- Utilization of Geothermal Cooling Waters for Waste Containment

Author(s)- / Morrison , Robert D. /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 469 , 2 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Illus. / Diagram (2) /

Ref.

Descriptor(s)- / Binary power generation / Geothermal power plants /
Waste heat / Waste water /

Abstract by Author

Geothermal power production utilizing a binary conversion process requires a substantial quantity of water for the cooling of the secondary or working fluid. Once this cooling water has left the condenser in such a system, it requires some form of process to lower its temperature. Several process alternatives are available: an evaporative dry cooling tower, a wet cooling tower, or a cooling lake. In those operations where a cooling lake is utilized or where large amounts of makeup water are stored, certain design parameters can be easily integrated into this cooling loop for the purpose of isolating geothermal or

Geopressured Geothermal Bibliography

associated wastes. The necessary physical conditions and benefits of this arrangement are the subject of this paper.

1088. GGIS-100134/R/ / /M/ / / / /

Title- Utilization of Seismic Exploration Technology for High Resolution Mapping of a Geothermal Reservoir

Subtitle- Final Report

Author(s)- / Goupillaud , P. L. / Cherry , J. T. /

Publisher- ERDA

Washington, D. C.

Publication date- April 1977

Pagination- 59 Pages

Report/patent- SAN/1249-1

Available- NTIS

(Paper copy)

(Microfiche)

Sponsor- / ERDA

EY-76-C-03-1249 /

Corporate Author- Systems, Science and Software

La Jolla , California , USA

Auxiliary expression(s)-

Illus. / Diagram (4) / Graph (28) / Map (2) /

Ref.

Descriptor(s)- / East Mesa KGRA / Geothermal exploration / Geothermal reservoirs / Imperial Valley / Seismic P waves / Seismic reflection surveys / Seismic S waves / East Mesa / Geothermal reservoir / Exploration / Seismic reflection / "Vibroiseis" technique / VP/VS ratio /

Abstract by Author

A seismic reflection survey using the "Vibroiseis" technique and a combination of both compressional and horizontally polarized shear waves has been successfully completed over the East Mesa Geothermal Field. The interpreted results of the survey clearly demonstrate that: 1) the compressional waves have the resolving power to detect anomalous conditions such as faults and fracture zones of critical importance in geothermal reservoir investigations; 2) the shear waves have penetrated to the target depth but the lower quality of the data thus acquired renders its processing and interpretation more difficult and less reliable. However, it also contains information which may prove essential for lithological discrimination, such as estimating the ratio VP/VS of the velocities.

1089. GGIS-100113/R/ / /M/ / / / /

Title- Utilization of U.S. Geothermal Resources

(Final Report)

Author(s)- / Reitzel , J. /

Publisher- TRW, Inc.

Redondo Beach, California (USA)

Publication date- 1976

Report/patent- ER-382

Corporate Author- TRW, Inc.

Systems and Energy Group
Redondo Beach, California, USA

Descriptor(s)- / Tectonics / Temperature measurement / Power generation / Economics / Losses / Theoretical treatments / Forecasting / Geothermal wells / Geothermometers / Hot springs / California / Idaho / Louisiana / New Mexico / Nevada / Texas / Wyoming / Utah / Oregon / Geopressed systems / Maps / Tables / Diagrams /

Abstract by TIC

This study is concerned with U.S. geothermal resources, their potential for commercial utilization by electric utilities between now and the year 2000, and their impact on the utility industry. USGS estimates of the resources in identified hydrothermal systems were extrapolated to the undiscovered resources marked by hot springs, and further to the blind resources between hot spring areas within the tectonic belts. The resulting estimate of the total hydrothermal resource to a depth of 10,000 ft. is about 100,000 MWe for 30 years with about one-half in undiscovered blind resources, one-fourth in undiscovered hot spring resources, and one-fourth in identified systems. Water rates and direct capital costs for geothermal power plants were evaluated as functions of resource temperature, together with costs and expected flowrates for geothermal wells. Combining these results with the temperature distribution of identified hydrothermal systems, a current supply curve for geothermal energy was made. This shows an estimated 20,000MWe for 30 years potentially producible with current technology from identified resources for direct capital costs of \$800/KW or less. The projected supply curve shows an estimated 30,000 to 60,000 MWe for 30 years potentially available at \$800/KW or less, in 1976 dollars, taking account of estimated undiscovered resources and probable technical advances.

1090. GGIS-100132/R/ / /M/ / / / /

Title- Vapor-Droplet Flow Equations

Author(s)- / Crowe, C. T. /

Publication date- August 18, 1975

Report/patent- UCRL-51877

Sponsor- / ERDA

W-7405-ENG-48 /

Corporate Author- California University, Livermore

Lawrence Livermore Laboratories

Livermore, California, USA

Descriptor(s)- / Energy transfer / Equations / Mass transfer / Phase transformations / Vapor dominated hydrothermal systems / Vapor droplet flow /

Abstract by Author

This report discusses the general features of a vapor-droplet flow and derives the equations expressing the conservation of mass, momentum, and energy for the vapor, liquid, and mixture using the control volume approach. The phenomenological laws describing the exchange of mass, momentum, and energy between phases are also reviewed. The

results have application to development of water-dominated geothermal resources.

1091. GGIS-100058/J/ / /A/ / / / /

Title- Vast Potential Held by Four "Unconventional Gas Sources"

Author(s)- / Kuuskraa , Vello A. / Brashear , J.P. / Doscher , Todd M. / Elkins , Lloyd E. /

Publication date- Vol. 76 , Issue 24 , June 12 , 1978

Pagination- Page 47 , 8 Pages

Corporate Author- Lewin and Associates, Inc.

Washington , D.C. , USA

Auxiliary expression(s)-

Illus. / Graph (6) / Map (2) /

Table

Ref.

Descriptor(s)- / Exploitation / Gas production / Geopressured zones / Methane / Natural gas / Permeability / Resource assessment /

Abstract by Compendex

A study of unconventional sources of natural gas shows that advanced technology and a \$3/Mcf gas price could stimulate U.S. production from these sources and potentially double the amount of currently proved natural gas reserves. As much as 220 trillion cu. ft. of additional gas is projected. These unconventional sources include tight gas basins, Devonian shale, methane from coal seams, and methane from geopressured aquifers.

1092. GGIS-100303/R/ / /M/ / / / /

Title- Viscosity and Density Tables of Sodium Chloride Solutions

Author(s)- / Fair , James A. / Ozbek , Huseyin / Phillips , Sidney L. /

Publication date- April 1977

Pagination- 48 Pages

Corporate Author- California Univ., Berkeley

Lawrence Berkeley Lab., National Geothermal Information Resource
Berkeley , California , USA

Descriptor(s)- / Aqueous solutions / Bibliographics / Data / Density / Elevated concentration / Elevated pressure / Elevated temperature / Geothermal resources / Low concentration / Moderate concentration / Sodium chlorides / Viscosity /

Abstract by Author (rev.)

Numerical data printouts on the viscosity and density of sodium chloride solutions at elevated temperatures and pressures is presented. The printouts contain tabulated experimental data which were extracted from the available literature and which, where necessary, were recalculated to conform to the following units: molality, g/cm³, and 12°C atomic weight standard. These data tabulations give the user a comprehensive consideration of the current status of experimental data on the viscosity and density of sodium chloride solutions at elevated temperatures and pressures, data urgent both to research and development of geothermal electrical and non-electrical systems. The bibliography follows the tables.

1093. GGIS-100141/R/ / /M/ / / / /

Title- Viscosity of Aqueous Sodium Chloride Solutions from 0-150 DEG

C
Author(s)- / Ozbek , H. / Fair , J. A. / Phillips , S. L. /

Publication date- December 1977

Pagination- 61 Pages

Report/patent- LBL-5931

Note- Presented in part at the American Chemical Society 29. Southeast Regional Meeting, Tampa, FL. NOV. 9-11, 1977.

Sponsor- / U. S. Department of Energy

W-7405-ENG-48 /

Corporate Author- California University, Berkeley

Lawrence Berkeley Laboratories

Berkeley , California , USA

Auxiliary expression(s)-

Illus. / Graph (5) /

Table

Ref.

Descriptor(s)- / Aqueous solutions / Concentration dependence /
 Elevated temperature / Empirical equations / Pressure dependence
 / Sodium chlorides / Temperature dependence / Viscometers /
 Viscosity /

Abstract by Author

A critical evaluation of data on the viscosity of aqueous sodium chloride solutions is presented. The literature was screened through October 1977, and a databank of evaluated data was established. Viscosity values were converted when necessary to units of degrees C, centipoise and molal concentration. The data were correlated with the aid of an empirical equation to facilitate interpolation and computer calculations. The result of the evaluation includes a table containing smoothed values for the viscosity of NaCl solutions to 150 DEG C.

1094. GGIS-100995/ / / /A/ / / / /

Title- Viscosity of Geothermal Brines

Author(s)- / Potter , Robert W., II /

Publication date- Vol. 2 , Issue 2 , 1978

Pagination- Page 543 , 2 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Auxiliary expression(s)-

Table

Ref.

Descriptor(s)- / Geothermal brines / Models / Salinity / Viscosity /

Abstract by Author

One of the prerequisites of modeling the flow of fluid in a geothermal reservoir is knowledge of the viscosity of the fluid

Geopressured Geothermal Bibliography

involved. Due to a general paucity of viscosity data for high-temperature brines, the general practice outside the petroleum industry has been to use some empirical correlation of the viscosity of pure water other than those formulated for the steam tables. This paper suggests some alternative methods to model the viscosity of brines and describes a model which allows the limited data for brines to be extrapolated to conditions of interest in a geothermal reservoir.

1095. GGIS-100393/O/ / /A/ / / / /

Title- Visual Kerogen and Vitrinite Reflectance Analysis of the Pleasant Bayou No. 1 Well, Brazoria County, Texas

Author(s)- / Schwab, Karl W. /

Publisher- 4th Geopressured Geothermal Energy Conference

Publication date- Vol. 1, June 1980

Pagination- Page 85, 47 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

78712

(Paper copy)

Local Availability- CES

Sponsor- / Gas Research Inst., Chicago, IL (USA)

5011-321-0125 /

Corporate Author- Geo-Strat, Inc.

Houston, TX, USA

Auxiliary expression(s)-

Illus. / Diagram (16) / Graph (6) / Map (1) / Figure (1) /
Table

Descriptor(s)- / Bottom hole temperature / Brazoria County / Cuttings analysis / Exploitation / Frio Formation / Geopressured zones / Geothermal gradients / Hydrocarbons / Kerogen / Maturation / Methane / Organic matter / Production testing / Pleasant Bayou No. 1 Well / Sedimentation / Strata / Vitrinite / Reflectance /

Abstract by Author

Visual kerogen vitrinite reflectance analyses of forty (40) well cuttings samples and two (2) core specimens from the Pleasant Bayou No. 1 well show that the maturation of the sediments ranges from immature at 2,894 feet to marginally mature at 16,500 feet. A significant jump in the thermal maturation index, T.A.I., occurs near the T-3 seismic horizon of the Frio Formation. Whether this jump represents a regional unconformity, a change in the environment of deposition, or a change in the quality of the drill cuttings is unclear at this writing. Although the present temperature of the sediments at 16,500 feet is in excess of 325 DEG F, the color of the extracted palynomorphs indicates that the paleotemperature was considerably less, probably in the range of 190 DEG F to 200 DEG F. <Note: Paleotemperature, as used in this report, refers to the maximum sustained temperature experienced by the kerogenaceous debris since its deposition and incorporation into the surrounding sediment. It is the paleotemperature which is used to define the state of thermal

maturity and the hydrocarbon facies one can expect to encounter in a given stratigraphic section.> The organic matter type, O.M.I., as defined from the visual kerogen slides, is variable. Above 6,080 feet the kerogenaceous debris is predominantly an amorphous, spore-pollen, vitrinite suite. Its source quality, i.e. "oil generating potential," is good. From 6,080 feet to T.D., the kerogen assemblage is primarily a vitrinite, plant tissue, and spore-pollen mixture. Its source quality, insofar as lipid-rich constituents are concerned, is fair. Distinct changes in the organic matter suite were observed in the Miocene between 5,360 and 6,080 feet and at the top of the Frio, 9,020 to 9,440 feet, and at the T-3 seismic horizon, 11,180 to 11,600 feet. Additional variations can also be seen between the T-3/T-4 and T-4/T-5 seismic horizons at 11,180-11,600 and 12,260-12,680 feet respectively. Due to the gross immaturity of the sediments in the Pleasant Bayou No. 1 Well, one can only speculate that the major hydrocarbons which have been formed in situ consist of non-commercial quantities of biogenic methane and/or wet gas. This prediction does not exclude the possibilities of large accumulations of thermally derived methane.

1096. GGIS-100031/J/ / 54/A/ / / / /

Title- Wairakei Geothermal Steam Project

Journal- Civ. Eng. (London)

Publication date- Vol. 54, February 1969

Pagination- Page 191, 4 Pages

Descriptor(s)- / Geopressured systems / Geothermal fluids /
Geothermal wells / New Zealand / Performance / Specifications /
Wairakei Geothermal Field /

1097. GGIS-100240/J/ / /A/ / / / /

Title- Water Conflicts from the Viewpoint of a Regulator

Author(s)- / Hansen, Dee C. /

Journal- Land Water Law Review

Publication date- Vol. 13, Issue 1, 1977

Pagination- Page 151, 8 Pages

Descriptor(s)- / Energy source development / Evaporation / Geothermal
resources / Legal aspects / Water rights /

Abstract by EIC

The potential for geothermal development in the western U. S. appears very good. The biggest hurdle to overcome is the large quantities of water that will be consumptively evaporated into the atmosphere in the generations of electricity. At present, there are more questions than answers as to the effects of geothermal development on existing water rights.

1098. GGIS-100053/J/ / /A/ / / / /

**Title- Water Drive from Interbedded Shale Compaction in
Supercritical Gas Reservoirs**

Geopressed Geothermal Bibliography

Subtitle- A Model Study

Author(s)- / Chierici , G.L. / Ciucci , G.M. / Sclocchi / Terzi , L.

Publication date- Vol. 30 , Issue 6 , June 1978

Pagination- Page 937 , 10 Pages

Descriptor(s)- / Compaction / Geopressure / Geopressed reservoirs /
Natural gas deposits / Permeability / Sand / Shale / Simulation /
Water drive /

Abstract by J. Pet. Tech.

The behavior of abnormally high-pressured gas reservoir in sand formations with randomly interbedded, thin, noncontinuous shale layers is examined using numerical simulation. The relevance of the internal water drive resulting from shale compaction and the influence of mobile water generation on reservoir and well behavior are discussed.

1099. GGIS-100018/O/ / 8/M/ // //

Title- Water Management by the Electric Power Industry

Author(s)- / Gloyna , E. F. /

Conference- Water Resources

Publication date- Vol. 8 , 1975

1100. GGIS-100053/J/ / 2107/A/ // //

Title- Water Production from Abnormally Pressured Gas Reservoirs in South Louisiana

Author(s)- / Wallace , W. E. /

Journal- Journal of Petroleum Technology

Publication date- Vol. 21 , Issue 7 , July 1969

Pagination- Page 969

Auxiliary expression(s)-

Ref.

Descriptor(s)- / Natural gas wells / Dewatering / Petroleum reservoir engineering /

Abstract by NTIS

In some cases, when gas is produced from geopressed reservoirs, water will appear in quantity, occasionally to exclusion of all gas; Gulf Coast area contains many thick sections of undercompacted shales with interspersed geopressed sand lenses; when pressures within these lenses are reduced by gas production, compaction process, interrupted by state approaching equilibrium, is permitted to resume; as result water is often expelled from shale into space formerly occupied by gas and ultimately reaches well bore; activity of water can be anticipated and calculated. 15 refs.

1101. GGIS-100002/O/ / 2/A/ // //

**Title- Water Production from Abnormally Pressured Gas Reservoirs in South Louisiana
(2nd Part)**

Author(s)- / Wallace , W. E. /
 Conference- Abnorm. Subsurf. Pressure
 Baton Rouge
 Louisiana
 USA

Publication date- Vol. 2 , 1970

Pagination- Page 63 , 16 Pages

Auxiliary expression(s)-
 Illus.

Descriptor(s)- / Louisiana / Engineering geology / Ground water /
 Geopressured reservoirs / Connate water / Gulf Coast / Gas /
 Production / Geopressure / United States /

 1102. GGIS-10Q169/J/ / /A/ / / / /

Title- Water Required to Develop Geothermal Energy

Author(s)- / Dorfman , M. H. /

Journal- Journal of the American Water Works Association

Publication date- Vol. 68 , July 1976

Pagination- Page 370 , 5 Pages

Descriptor(s)- / Contamination / Environmental effects / Geothermal
 resources / Ground subsidence / Ground water / Pollution / Water
 pollution / Water requirements / Binary fluid systems /
 Geopressured systems / Geothermal energy conversion / Hot water
 systems / Vapor dominated systems /

Abstract by DOE/RECON

Geothermal resources may be found distributed in the earth in a
 variety of modes consisting of various fluid and reservoir
 characteristics. It seems likely that these resources will
 represent a substantial portion of the world's total energy
 supply as the availability of petroleum declines. Important
 environmental considerations, however, including the problems
 of subsidence and ground-water contamination, must be further
 researched in order to determine the extent of possible problems
 and methods for mitigating their effects.

 1103. GGIS-100018/O/ / / 8/A/ / / / /

**Title- Water Required to Develop Geothermal Energy, Problems of
 Residuals Disposal and Geopressured Zones as Water Sources
 (Paper 21 in Water Management by the Electric Power Industry)**

Author(s)- / Dorfman , Myron H. /

Conference- Water Resources

Publication date- Vol. 8 , 1975

Pagination- Page 230 , 12 Pages

Auxiliary expression(s)-
 Illus.

Descriptor(s)- / Geological surveys / Geopressured systems /
 Geothermal energy / Geothermal resources / Hot water systems /
 Reviews / Vapor dominated systems / Water requirements / Water
 resources / Production / Uses / Geopressure /

Abstract by ERDA/RECON

Geologic modes of geothermal occurrence that are in current use
 and those that appear to represent potential sources of useful

Geopressured Geothermal Bibliography

energy are described. The concomitant water problems and benefits that may be associated with each type are discussed. Vapor-dominated, liquid-dominated, and geopressurized zones are considered. (MOW)

1104. GGIS-100018/0/ / 8/A/ // //

Title- Water Required to Develop New Fuel Sources

(Section 4 in Water Management by the Electric Power Industry)

Author(s)- / Hocott , Claude R. / Dorfman , Myron H. / Underhill , G. K. / Parker , Frank L. / Shock , D. A. / Backus , Charles E. / Brown , Merwin L. /

Conference- Water Resources

Publication date- Vol. 8 , 1975

Pagination- Page 225 , 53 Pages

Auxiliary expression(s)-

Illus. / Diagram (16) / Graph (6) / Map (8) / Photo (5) /

Ref.

Table

Descriptor(s)- / Water requirements / Tertiary recovery / Nuclear fuel cycle / Geothermal energy / Solar power plants / Coal / Secondary recovery / Geo brine / Hot water / Coal deposits / Nuclear fuel processing / Water flooding /

Abstract by Energyline

Water requirements for development and processing of oil recovery, geothermal energy, nuclear fuels, coal, and solar energy are reviewed. Enhanced oil recovery relies primarily on water as the basic displacing agent. Modes of geothermal energy, such as vapor- and liquid-dominated convective systems and geopressured zones, all have different fluid and reservoir characteristics, and water problems and benefits; electric generation mechanics are diagramed for each. Total water and electric energy requirements are given for one 1000 MWE LWR for: uranium mining and milling, uranium hexafluoride production, uranium enrichment, fuel fabrication, reactors, fuel reprocessing, and waste management. The coal mining industry is profiled; eastern coal mining requires design for minimal water drainage, water treatment plants, and close control of water in coal preparation plants, while western coal mines require more attention to hazards of stripmining. Solar power water requirements are also reviewed. (16 diagrams, 6 graphs, 8 maps, 5 photos, 68 references, 9 tables)

1105. GGIS-100018/0/ / 8/A/ // //

Title- Water Requirements for Geothermal Energy Utilization

(Paper 22 in Water Management by the Electric Utility Industry)

Author(s)- / Underhill , G. K. /

Conference- Water Resources

Publication date- Vol. 8 , 1975

Pagination- Page 242 , 8 Pages

Descriptor(s)- / Cooling / Electric power / Geopressured systems / Geothermal power plants / Hot dry rock systems / Hot water

systems / Power generation / Thermal efficiency / Uses / Vapor dominated systems / Water pollution / Water requirements /
 Abstract by ERDA/RECON

Geothermal resources are divided into four distinct types: (1) vapor-dominated convective, (2) liquid-dominated convective, (3) geothermal pressure, and (4) hot dry rocks.

1106. GGIS-100534/J/ / /A/ / / / /

Title- Watt Tries to Speed Leasing Program, Congress Looks at Bills to Boost Industry

Publisher- The Bureau of National Affairs
 Washington, D.C.

Publication date- Issue 430 , November 5 , 1981

Pagination- 3 Pages

Local Availability- CES

Descriptor(s)- / Energy policy / Energy source development /
 Geothermal exploration / Leasing / Legislation / National government /

Abstract by GGIS

Interior Secretary James Watts's directive to the BLM, the USGS, and the National Park Service to speed up the federal geothermal leasing program is discussed. Industry support for geothermal development is summarized.

1107. GGIS-100533/O/ / /A/ / / / /

Title- Well Log Interpretation at the Cerro Prieto Field

Author(s)- / Ershaghi , I. / Ghaemian , S. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
 Stanford, CA

Publication date- 1980

Pagination- Page 258 , 6 Pages

Local Availability- GGIS

Corporate Author- University of Southern California
 Los Angeles , USA

Auxiliary expression(s)-

Illus. / Diagram (2) / Figure (3) / Graph (2) / Map (1) /
 Ref.

Descriptor(s)- / Cerro Prieto Geothermal Field / Data analysis /
 Diagrams / Formation testing / Geothermal gradient surveys /
 Geothermal wells / Mexico / Physical properties / Porosity /
 Thermal exploration methods / Well logging /

Abstract by GGIS

Well logs from Cerro Prieto are interpreted to examine alterations in rock properties caused by rock-fluid interaction and its affect on well log responses in a sedimentary type geothermal field.

Geopressed Geothermal Bibliography

1108. GGIS-100108/B/ / /M/ / / / /

Title- Well Logs

Subtitle- A Basic Drilling Tool
Author(s)- / Matthews , W. R. /
Publisher- Petroleum Publishing Company
Tulsa, Oklahoma (USA)
Publication date- 1972

1109. GGIS-100533/O/ / /A/ / / / /

Title- Well Test Analysis Research

Author(s)- / Ramey , H.J. / Horne , R.N. / Miller , F.G. / Brigham , W.E. /

Conference- Sixth Workshop on Geothermal Reservoir Engineering (December 16 , 1980)

Publisher- Stanford Geothermal Program, Stanford University
Stanford, CA

Publication date- 1980

Pagination- Page 150 , 9 Pages

Local Availability- GGIS

Corporate Author- Stanford Univ.
CA , USA

Auxiliary expression(s)-
Illus. / Graph (5) /
Ref.

Descriptor(s)- / Accumulation / Analysis / Cerro Prieto Geothermal Field / Comparative evaluations / Diagrams / Flow rate / Fluid flow / Geothermal gradients / Geothermal systems / Graphs / Mathematical models / Mathematics / Models / Pressure drawdown / Production decline curve / Storage / Well analysis / Well testing /

Abstract by GGIS

Some results of the following field applications of well test analysis are summarized: constant pressure testing, parallelipiped models, "slug test" DST analysis, analysis of wells with phase boundaries, internal well flows, naturally fractured reservoirs, and temperature-induced wellbore storage effects.

1110. GGIS-100411/O/ / 1/A/ / / / /

Title- Well-Information Systems as Applied to Geopressed Reservoir Descriptions

Author(s)- / Young , F. S. /

Conference- 2nd Geopressed Geothermal Energy Conference
Austin
Texas
USA

Publication date- Vol. 1 , Issue 1 , 1975

Pagination- Page 193 , 12 Pages

Available- Center for Energy Studies)

Available- NTIS

(Paper copy)

(Microform)

Auxiliary expression(s)-

Illus. / Figure (6) / Graph (6) / Photo (3) /

Ref.

Table

Descriptor(s)- / Geopressured systems / Information systems /
Lithology / Measuring methods / Monitoring / Pressure
measurement / Temperature measurement / Well drilling / Well
logging /

Abstract by ERDA/RECON

Some of the problems encountered in drilling for indigenous energy sources include high temperature and pressure, unstable rock formations, and severe drilling-fluid contamination. To avert the consequences of many of these occurrences, elaborate and sophisticated systems have been developed to monitor the drilling operational safety. In addition, valuable quantitative information is generated during the monitoring process, which can be used to describe subsurface structural features, the nature of pore fluids, and certain basic rock properties useful in reservoir engineering. A brief discussion of contemporary well-information systems is provided.

1111. GGIS-100528/O/ / /A/ / / / /

Title- Wells of Opportunity

Subtitle- Introduction

Author(s)- / Westhusing, Keith /

Conference- Fifth Conference on Geopressured-Geothermal Energy (October 13, 1981)

Publication date- 1981

Pagination- Page 161, 2 Pages

Local Availability- GGIS

Local Availability- CES

Auxiliary expression(s)-

Table

Descriptor(s)- / Geopressure resources / Louisiana / Recommendations / Texas / US DOE / Well testing / Wells of opportunity /

Abstract by GGIS

An introduction to the DOE's Wells of Opportunity program is presented.

1112. GGIS-100308/O/ / /A/ / / / /

Title- Wellsite Verification Testing of an Advanced Geothermal Primary Heat Exchanger

Author(s)- / Addoms, J.F. / Breindel, B. / Gracey, C.M. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25, 1978)

Publisher- Geothermal Resources Council

Davis, California

Geopressured Geothermal Bibliography

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 1 , 4 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Aerojet Energy Conversion Co.

Sacramento , California , USA

Auxiliary expression(s)-

Illus. / Diagram (1) / Photo (3) / Graph (2) /

Descriptor(s)- / Fouling / Geothermal brines / Heat exchangers /
Scaling control /

Abstract by Author

This paper describes the wellsite test phase of a research program conducted by Aerojet Energy Conversion Company to establish the feasibility of using a recirculating solid bed material to eliminate heat exchanger fouling in geothermal service. Phase I of this program culminated in a laboratory demonstration APEX concept feasibility with brine simulants. Testing under the current project phase of the research effort was conducted at the Geothermal Component Test Facility located at East Mesa, California. Technical feasibility was established by testing the effectiveness of the bed material in preventing the fouling of a heat exchanger test section. The elimination of fouling was demonstrated using both geothermal well water and facility cooling water as the fouling fluids.

1113. GGIS-100011/0/ / /A/ / / / /

Title- Wet and Dry Steam Systems

(1st Subgroup Paper)

Author(s)- / Williams , David L. /

Conference- Magnitude and Deployment Schedule of Energy Resources

Publication date- September 1975

Pagination- Page 65 , 3 Pages

Report/patent- CONF--750720-

Descriptor(s)- / Economics / Hot water systems / Land leasing / Legal aspects / Mineral rights / Power potential / Resource development / Taxes / Vapor dominated systems /

Abstract by Author

Two types of hydrothermal resources are described here-- dry steam (vapor dominated) systems and hot water (liquid dominated) systems. The greatest mid-term (1985-2000) potential development appears to lie in lower grade reservoirs with water temperatures between 150 DEG C (302 DEG F) and 220 DEG C (428 DEG F). Demonstration plants which will convert hot water at these temperatures to electricity are critically needed. In the year 2000, existing technology should produce at least 7,000 megawatts of electricity and new technology could increase this to greater than 50,000 megawatts. Attaining this potential will be affected by the availability of hardware and legal and institutional problems. Environmental statements, permits, regulatory review, taxes, questions of mineral and water rights, land leasing laws, and regulation of utilities contribute to the

delay of projects. Furthermore, the price of electricity produced from geothermal fluids must compare favorably with the price of electricity produced from other energy sources if development is to continue.

1114. GGIS-100058/J/ / /A/ // //

Title- Wilcox Gas-Reservoir Characteristics in Northeast Thompsonville Field

Author(s)- / Berg , R.R. / Tedford , F.J. /

Publication date- Vol. 76 , Issue 6 , February 6 , 1978

Pagination- Page 96 , 7 Pages

Descriptor(s)- / Geologic structures / Geological setting / Natural gas fields / Petrography / Reservoir properties / Reservoir rocks / Sandstone / Subsurface reservoirs / Texas / Wilcox Formation /

Abstract by TIC

A turbidite origin for deeper Tertiary sandstones is found to be encouraging for future exploration in the Gulf Coast Province. The discovery of Northeast Thompsonville field in 1959 showed significant gas production could be found in the deep Wilcox Eocene of South Texas. Prior to that find, it was generally thought few reservoir sandstones would be present in the dominantly marine-shale facies of the deep Wilcox and the potential for production was poor. The regional structure of South Texas, the petrography of Wilcox sandstones, and the reservoir morphology are examined.

1115. GGIS-100393/O/ / /A/ // //

Title- Wilcox Group - Potential for Geopressed Geothermal Sandstone Reservoirs

Author(s)- / Edwards , Marc B. / Bebout , Don G. / Gregory , A. Ray / Weise , Bonnie R. /

Publisher- 4th Geopressed Geothermal Energy Conference

Publication date- Vol. 1 , June 1980

Pagination- Page 312 , 62 Pages

Available- Center for Energy Studies

University of Texas at Austin

ENS 143

Austin

TX

78712

(Paper copy)

Local Availability- CES

Sponsor- / Department of Energy, Washington, DC (USA)

DE-AS05-76ET-28461 /

Corporate Author- Texas Univ., Austin

Bureau of Economic Geology

Austin , TX , USA

Auxiliary expression(s)-

Illus. / Diagram (11) / Graph (4) / Map (16) /

Table

Ref.

Geopressured Geothermal Bibliography

Descriptor(s)- / Areal geology / Fairway analysis / Geopressure exploration / Geopressured reservoirs / Methane / Power potential / Productivity / Reservoir properties / Resource assessment / Site selection / Stratigraphy / Texas / Wilcox formation / Colorado Fairway / DeWitt Fairway / Duval Fairway / Harris Fairway / Live Oak Fairway / Zapata Fairway / Formation thickness /

Abstract by Author

The objective of this study is to identify areas along the Wilcox trend favorable for producing large quantities of hot water from the geopressured zone in order to separate methane from solution and produce electrical energy from heat. Reservoirs likely to contain geopressured geothermal fluids in economic quantities occur in the Wilcox Group where the gulfward-dipping sandstone/shale wedge thickens abruptly across a complex growth-fault system. The Wilcox comprises sandstone-rich upper and lower parts representing two major progradational cycles, and a shale-rich middle part representing a major transgression. Lower Wilcox deltaic sequences occur in lobate patterns along the Middle and Upper Texas Gulf Basin, while major upper Wilcox deltas occur in the Lower Texas Gulf Basin. On the basis of maximum sandstone development and formation temperatures greater than 300 DEG F (149 DEG C), six geothermal fairways were delineated in Zapata, Duval, Live Oak, De Witt, Colorado, and Harris Counties. In addition, detailed studies were conducted to identify sites for drilling test wells. The De Witt Fairway is considered the prime test site area; the Cuero Prospect contains more than 550 ft (170 m) of sandstone with an area of approximately 14 mi**2 (36 km**2). The prospective sandstones occur at the tops of at least eight coarsening upward cycles; progressively shallower cycles contain increasingly permeable sandstones deposited in more proximal deltaic environments. The Colorado Fairway contains the second test site area. The Eagle Lake Prospect contains 1,240 ft (380 m) of sandstone and extends over an area of approximately 10 mi**2 (26 km**2). However, there is a question as to the presence of adequate thickness of high-permeability zones.

1116. GGIS-100511/R/ / /M/ / / / /

Title- Wilcox Sandstone Reservoirs in the Deep Subsurface Along the Texas Gulf Coast

(Final Report)

Subtitle- Their Potential for Production of Geopressured Geothermal Energy

Author(s)- / Bebout , D. G. / Weise , B. R. / Gregory , A. R. / Edwards , M. B. /

Publication date- October 1979

Pagination- 229 Pages

Report/patent- DOE/ET/28461-T1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C. (USA)

EY-76-S-05-4891 /

Corporate Author- Texas Univ.
Bureau of Economic Geology
Austin, USA

Descriptor(s)- / Colorado Fairway / Depositional environment / De Witt Fairway / Duval Fairway / Geologic structures / Gulf Coast / Harris Fairway / Live Oak Fairway / Permeability / Porosity / Salinity / Sandstone / Temperature / Texas / Wilcox Formation / Zapata Fairway /

Abstract by NTIS

The following subjects are included: regional setting, stratigraphic sections, Lower Wilcox sandstone distribution, formation pressure, formation temperature used to delineate geothermal fairways, Zapata Fairway, Duval Fairway, Live Oak Fairway, De Witt Fairway, Colorado Fairway, and Harris Fairway. Depositional and structural style, formation pressures and temperatures, porosity and permeability, formation water salinity, and Cuero Prospect are covered for De Witt Fairway. Depositional and structural style, formation and fluid properties, and Eagle Lake Prospect are covered for Colorado Fairway.

1117. GGIS-100308/0/ / /A/ / / / /

Title- Working Fluid and Cycle Selection Criteria for Binary Geothermal Power Plant

Author(s)- / Ingvarsson, I.J. / Turner, S.E. /

Conference- Geothermal Resources Council 2nd Annual Meeting

Hilo

Hawaii

USA (July 25 , 1978)

Publisher- Geothermal Resources Council

Davis, California

Publication date- Vol. 2 , Issue 1 , 1978

Pagination- Page 309 , 3 Pages

Available- Geothermal Resources Council

P.O. Box 98

Davis

California

95616

Local Availability- CES

Corporate Author- Idaho National Engineering Lab.

Idaho Falls , Idaho , USA

Auxiliary expression(s)-

Illus. / Diagram (4) / Graph (1) /

Descriptor(s)- / Binary cycle power generation / Elevated temperature / Geothermal fluids / Geothermal power plants / Pentane / Propane / Thermodynamic cycles / Working fluids / 2-methylpropane /

Abstract by Author

Binary cycles using refrigerants as working fluids are an effective means of developing geothermal resources for power production. In order to maximize the utilization of the geothermal fluid resource over a temperature range of from 220 DEG to 400 DEG F (104 DEG to 204 DEG C), a study was performed to optimize a 50 MW plant design with respect to working fluid and thermodynamic cycle. Results indicate that, of the four fluids studied, propane is optimum for geothermal fluid temperatures

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of 200 DEG to 280 DEG F (93 DEG to 138 DEG C). For a temperature range of 300 DEG to 360 DEG F (149 DEG to 182 DEG C), isobutane performed best, and for temperatures of 380 DEG to 400 DEG F (193 DEG to 204 DEG C), pentane was most effective.

1118. GGIS-100042/J/ / 402/A/ // //

Title- Worldwide Geothermal Energy Resource Development

Author(s)- / Saint , Prem K. / Jasso , Abel /

Journal- Geothermal Energy Magazine

Publication date- Vol. 4 , Issue 2 , February 1976

Pagination- Page 5 , 7 Pages

Auxiliary expression(s)-

Illus. / Diagram (2) / Photo (2) /

Ref.

Descriptor(s)- / Geothermal power plants / Geothermal space heating / Europe / New Zealand / Iceland / Latin America / Japan / USSR / Turkey / Israel / India / East Africa / Philippines / Mexico /

Abstract by Energyline

Geothermal energy resources, on a worldwide scale are being used for space heating, bathing, agriculture, industry, and electrical production. Divergent plate boundaries, convergent plate boundaries, and geopressured basins are defined. Geothermal development in Iceland, New Zealand, Mexico, El Salvador, Guadalupe, Chile, Nicaragua, Eastern Europe, the Philippines, Japan, the USSR, Italy, Israel, Turkey, East Africa, and India is surveyed. (2 diagrams, 5 photos, 17 refernces)

1119. GGIS-100002/O/ / 3/A/ // //

Title- Worldwide Occurrence of Abnormal Formation Preesures

Subtitle- 1st Part

Author(s)- / Fertl , Walter H. /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 3 , 1972

Pagination- Page 29 , 11 Pages

1120. GGIS-100002/O/ / 3/A/ // //

Title- Worldwide Occurrence of Abnormal Formation Pressures

Subtitle- 2nd Part

Author(s)- / Rehm , Bill /

Conference- Abnorm. Subsurf. Pressure

Baton Rouge

Louisiana

USA

Publication date- Vol. 3 , 1972

Pagination- Page 43

Descriptor(s)- / Gas / Occurrence / United States / Southeast / Africa
/ North Sea /

1121. GGIS-100291/R/ / /M/ / / / /

Title- WELCST

(Description and User's Guide)

Subtitle- Engineering Cost Model of Geothermal Wells

Author(s)- / Entingh , Daniel J. / Lopez , Al /

Publication date- February 1972

Pagination- 129 Pages

Report/patent- DOE/ET/28505-T1

Available- NTIS

(Paper copy)

(Microfiche)

Local Availability- CES

Sponsor- / Department of Energy, Washington, D.C.(USA). Div. of
Geothermal Energy

EG-77-C-01-4014 /

Corporate Author- Mitre Corp.

METREK Div.

McLean , VA , USA

Auxiliary expression(s)-

Illus. / Diagram (9) / Figure (4) / Graph (1) /

Table

Ref.

Descriptor(s)- / Accidents / Computer codes / Cost / Engineering /
Forecasting / Geothermal wells / Mathematical models /
Optimization / Research programs / Simulation / Systems analysis
/ Well completion / Well drilling /

Abstract by Author

This paper describes WELCST, a FORTRAN code for estimating the effects of R&D project results upon the future cost of geothermal wells. The code simulates the drilling and completion of a well at 27 specific U.S. geothermal prospects, given assumptions about well design and casing plan, formation drillability, and selected engineering and cost characteristics of today's drilling technology. The user may change many of the assumptions about engineering and cost characteristics to allow WELCST to simulate impacts of specific R&D projects on the estimated cost of wells at the prospects. An important capability of WELCST is that it simulates rates and costs of major drilling mishaps, based on drilling incident data from Imperial Valley and Geysers geothermal fields. WELCST is capable of estimating geothermal well costs at liquid-dominated (hydrothermal) sites, vapor-dominated sites, and Hot Dry Rock sites. The model can contribute to many system-optimization studies, and could be easily adapted to estimate well costs outside of the United States.

1122. GGIS-100249/J/ / /A/ / / / /

Title- You've Struck White Gold

(Geothermal Potential in Texas)

Geopressured Geothermal Bibliography

Author(s)- / Chandler , James /
Journal- Tex. Flyer
Publication date- October 1977
Pagination- Page 27 , 2 Pages
Local Availability- GGIS
Descriptor(s)- / Constraints / Energy source development /
Geopressured systems / Geothermal systems / Hot dry rock systems
/ Hot springs / Methane / Power potential / Research programs /
Texas /

1123. GGIS-100290/ / / /M/ / / / /

Title- 10th World Energy Conference
(A Digest)

Subtitle- Energy Resources: Availability and Rational Use

Author(s)- / Grainger , L. /

Conference- 10. World Energy Conference (Energy Resources:
Availability and Rational Use)
Istanbul

Turkey (September 19 , 1977)

Publisher- IPC Science and Technology Press
Guildford, England

Publication date- Vol. 10 , September 1977

Note- Abstract only

Local Availability- Eng.

1124. GGIS-100173/R/ / /M/ / / / /

Title- 100,000 Quads of Natural Gas

Author(s)- / Brown , W. M. /

Publication date- October 1976

Pagination- 38 Pages

Report/patent- HI--2451/3-P

Available- Hudson Institute, Inc.
Croton-on-Hudson
NY)

Corporate Author- Hudson Inst., Inc.
Croton-on-Hudson , New York , USA

Descriptor(s)- / Coastal regions / Economics / Exploitation /
Exploration / Forecasting / Geopressured systems / Gulf of
Mexico / Natural gas / Natural gas deposits / Thermal waters /

Abstract by DOE/RECON

Of the various possible unconventional natural gas resources that have been examined, the most recent, and by far the largest, is that which is dissolved in the hot salt water within the geopressurized zones of the Gulf Coast. Recent assessments have estimated that the amount of gas contained in these waters, underlying about 150,000 sq. mi. of Texas and Louisiana--both onshore and offshore--is between 60,000 and 100,000 quads. In addition to the natural gas, there is a huge potential for producing electric power from the heat content of the fluid, as well as other potential uses for hot water. The net value of this geothermal heat may be about half that of the natural gas. The major problems associated with commercial production of the

fluids from these zones and the extraction of energy from the heat and pressure of the fluid are discussed and the long-term potential is estimated. It appears likely that commercial production will depend upon the existence of uncontrolled prices for natural gas and the satisfactory resolution of various legal, environmental, and institutional problems, all of which are likely to require considerable effort. Although the production potential from the Gulf Coast zones might be accurately estimated after a decade or so of active research and development, at present the long-term potential appears to be between 4 percent and 50 percent of the fluid within the reservoirs that are eventually developed. Although the costs of production of gas and electric power from this resource may not be cheap, the principal reservoirs should be relatively easy to locate in the onshore Gulf region because of the existing data available from the vast number of wells that have already been drilled.

1125. GGIS-100153/0/ / /M/ / / / /

Title- 11th Annual Meeting of the Geological Society of America,
South-Central Section
Conference- 11th Annual Meeting of the Geological Society of America,
South-Central Section
El Paso
Texas
USA (March 17 , 1977)
Publication date- Vol. 9 , January 1977

1126. GGIS-100411/0/ / 2/M/ / / / /

Title- 2. Geopressed Geothermal Energy Conference
(Feb. 23-25, 1976; Austin, Texas (USA))
Conference- 2nd Geopressed Geothermal Energy Conference
Austin
Texas
USA
Publication date- Vol. 2 , February 25 , 1976
Descriptor(s)- / Texas / Louisiana / Geopressed systems / Maps /
Diagrams / Environmental effects / Legal aspects / Reservoir
engineering / Direct utilization / Economics / Land use /
Geological setting / Seismic surveys / Energy reserves /
Hydrology / Mathematical models / Power generation / Chemical
composition / Forecasting / Drilling /

1127. GGIS-100005/0/ / 2/M/ / / / /

Title- 2. Proceedings
(Washington, D.C.)
Subtitle- May 12-14, 1975
Conference- Energy Technology II
Washington, D.C. (May 12 , 1975)

Geopressured Geothermal Bibliography

Publisher- Govt. Inst., INC.
Washington, D.C.
Publication date- Vol. 2 , 1975
Pagination- Page 344

1128. GGIS-100328/R/ / /M/ / / / /

Title- 2. Volume: Program Implementation
Publication date- Vol. 2 , June 30 , 1976
Pagination- 421 Pages

1129. GGIS-100235/O/ / /M/ / / / /

Title- 2nd International Symposium on Land Subsidence
Conference- 2nd International Symposium on Land Subsidence
Anaheim, CA, USA (December 10 , 1976)
Publisher- International Association of Hydrological Sciences
Paris
Publication date- 1977
Pagination- 676 Pages
Report/patent- CONF-761217--
Abstract by TIC

The Second International Symposium on Land Subsidence was held on December 13-17, 1976 at Anaheim, California. Its purpose was to bring together international specialists on land subsidence, to present the results of research and practice related to cause, effect, and control, and to take stock of the advance in knowledge taking place in the subject since the 1969 Symposium. Intensive development of water, oil, gas, and minerals to meet the needs of a more and more highly industrialized world has resulted in an increasingly wider interest in the land subsidence that frequently results from such development. The papers range in scope from mathematical modeling through broad descriptions of project progress and subsidence case histories to legal and economic aspects.

1130. GGIS-100005/O/ / 3/M/ / / / /

Title- 3. Proceedings
(Washington, D.C.)
Subtitle- Mar. 29-30, 1976
Conference- Energy Technology II
Publisher- Govt. Inst., INC.
Washington, D.C.
Publication date- Vol. 3 , March 31 , 1976
Pagination- 200 Pages

1131. GGIS-100897/ / / /M/ / / / /

Title- 6. Proceedings

Subtitle- Achievements in Perspective
Publisher- Gov. Inst., Inc.
Washington, D. C.
Publication date- Vol. 6 , 1979
Local Availability- CES

Geopressured Geothermal Bibliography

3.0 Appendix A

Local availability abbreviations

CES	Energy Information Service Center for Energy Studies University of Texas at Austin ENS 143 Austin, Texas 78712 (512 - 471 - 4946)
CES MF	Energy Information Service Microfiche collection
GGIS	Geopressured Geothermal Information System Center for Energy Studies University of Texas at Austin ENS 143 Austin, Texas 78712 (512 - 471 - 4946)

Geopressured Geothermal Bibliography

4.0 Appendix B

Journal abbreviations

Acta. Geod. Geophys. Montan.	Acta Geodetica, Geophysica et Montanistica (Hungary)
Akad. Wiss. DDR. Zentralinst. Phy. Erde, Veroeff.	Veroeffentlichungen des Zentralinstituts Physik der Erde
Am. Gas. Assoc. Mon.	American Gas Association Monthly
APEA J.	APEA (Australian Petroleum Exploration Association) Journal
Appl. Mech. Rev.	Applied Mechanics Reviews
Bol. Tec. Petrobras	Boletim Tecnico da PETROBRAS (Brazil)
Can. Min. J.	Canadian Mining Journal
Cent. Rech. Pau, Bull.	Societe Nationale des Petroles D'Aquitaine, Centre de Recherches, Bulletin (Pau, France)
Civ. Eng. (London)	Civil Engineering (London, England)
Dev. Sedimentol.	Developments in Sedimentology (Amsterdam, Netherlands)
Ecol. Law Q.	Ecology Law Quarterly (U.S.)
Energie	Energie (West Germany)
Energies	Energies (Canoga Park, California, U.S.)
Eng. Min. J.	Engineering and Mining Journal (U.S.)
Geol. Nefti Gaza	Geologiya Nefti i Gaza (USSR)
Geol. Pruzkum.	Geologicky Pruzkum (Czechoslovakia)
Geophys. Prospect.	Geophysical Prospecting (The Hague)
Geotherm. Rep.	Geothermal Report (U.S.)
Gerlands Beitr. Geophys.	Gerlands Beitrage zur Geophysik (East Germany)
Ground Water Newsl.	Ground Water Newsletter

Geopressured Geothermal Bibliography

Inf. ERDA Wkly. Announce.

Int. Geol. Rev.

Interstate Oil Compact
Comm. Com. Bull.

Izv. Vyssh. Uchebn. Zaved,
Geol. Razved.

Magy. Geofiz.

Meteorol. Mag.

Min. Eng. (New York)

Natl. Wildlife

Ocean Ind.

Rev. Gen. Therm.

Soc. Pet. Eng. J.

Tech. Poszukiwan

Tex. Flyer

Trans. Am. Nucl. Soc.

Water Resour. Res.

Z. Angew. Geol.

Information from ERDA Weekly
Announcements

International Geology Review (U.S.)

Interstate Oil Compact Commission
Committee Bulletin (U.S.)

Izvestiya Vysshikh Uchebnykh
Zavedenii, Geologiya i Razvedka
(USSR)

Magyar Geofizika (Hungary)

Meteorological Magazine (England)

Mining Engineer (New York, U.S.)

National Wildlife (U.S.)

Ocean Industry (U.S.)

Revue Generale de Thermique
(France)

Society of Petroleum Engineers
Journal (U.S.)

Technika Poszukiwan (Poland)

Texas Flyer: Texas International
Airlines' Inflight Magazine

Transactions of the American Nuclear
Society (U.S.)

Water Resources Research (U.S.)

Zeitschrift fuer Angewandte
Geologie (East Germany)

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Bull., Geotherm. Resour. Counc. (Davis, Calif.)
Geopressure resources 604
Bulletin of the South Texas Geological Society
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Cent. Rech. Pau, Bull.
Rumeau 109
Sourisse 109
Chem. Eng. News (Wash., D.C.)
Waldrop 487
Chem. Eng. Prog.
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Wilson 293
Chem. Week
Gulf Coast 147
Chemical Week
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- Charlson 271
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 - Faltermayer 348
- Gas, Wasser, Waerme
 - Adam 170
- Geol. Nefti Gaza
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- Geol. Prukum.
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- Geological Society of America Bulletin
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- Geophys. Prospect.
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- Geotherm. Rep.
 - Barnea 194
- Geothermal Energy Magazine
 - Chen 308
 - Durham 500
 - Elmer 393
 - Jasso 678
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 - Takahashi 308
- Geothermal Resources Research Conference
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- Geothermics
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- Gerlands Beitr. Geophys.
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 - Kasameyer 465
 - Owen 465
- Houston Geological Society Bulletin
 - Chapman 629
- Hydrocarbon Process
 - Chiang 643
 - Cobb 643
 - Holt 258
 - Klinzing 643
- Inf. ERDA Wkly. Announce.
 - Binary cycle power generation 203
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- Int. Geol. Rev.

- Afanas'yev 276
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Intersociety Energy Conversion Engineering Conference
Drilling 490
Howerton 25
Interstate Oil Compact Comm. Com. Bull.
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Journal of Geophysical Research
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Journal of Petroleum Technology
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Journal of Research U.S. Geological Survey
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Journal of the American Water Works Association
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Bailey 113
Watson 113
Min. Eng. (New York)
Jacoby 538
Paul 538
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Cook 628
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Henkoff 628
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Q. Bull., Geo-Heat Util. Cent.
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Sponsors

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 Department of Energy, Washington, D.C. (USA). Office of Environmental Compliance and Overview 44
 Department of Energy, Washington, D.C. (USA). Office of Technology Impacts 458, 621
 Department of Energy, Washington, D.C. (USA) 180, 599
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 Department of Energy, Washington, DC (USA) 16, 57, 62, 63, 118, 165, 288, 406, 421, 443, 497, 508, 515, 530, 547, 575, 576, 609, 632, 675
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 Department of Energy, Washington, DC (USA). Div of Geothermal Energy 7

Geopressured Geothermal Bibliography

- Department of Energy, Washington, DC (USA). Div. of Environmental Control Technology 559
- Department of Energy, Washington, DC (USA). Div. of Geothermal Energy 290, 363, 556
- Department of Energy, Washington, DC (USA), Div. of Geothermal Energy 173
- Department of the Interior, United States Geological Survey 228, 515
- EG and G Idaho, Inc., Idaho Falls (USA) 196, 622
- EG and G Idaho, Inc., Idaho Falls, (USA) 622
- Electric Power Research Inst., Palo Alto, CA (USA) 168, 245, 587, 592
- Electric Power Research Inst., Palo Alto, CA (USA). Advanced Power Systems Division 244
- Energy Research and Development Administration, Idaho Falls, ID (USA). Idaho Operations Office 434, 583
- Energy Research and Development Administration, Washington, D.C. (USA) 50, 332, 444, 568, 610
- Energy Research and Development Administration, Washington, D.C. (USA). Div. of Geothermal Energy 73, 75, 139, 277, 402, 450, 509, 528, 583, 593
- Energy Research and Development Administration, Washington, D.C. (USA). Office of Public Affairs 534
- ERDA 19, 22, 39, 45, 51, 233, 251, 254, 424, 473, 478, 531, 595, 620, 644, 659, 662, 663
- ET-78-G-05-5958 58
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- Fish and Wildlife Service 156
- Gas Research Inst., Chicago, IL 442
- Gas Research Inst., Chicago, IL (USA) 60, 85, 108, 125, 211, 221, 229, 254, 398, 441, 468, 501, 549, 557, 611, 651, 666
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- Texas Univ. Bureau of Economic Geology 473
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- U. S. Department of Energy 41, 106, 111, 138, 157, 208, 264, 306, 380, 393, 466, 518, 665
- U. S. Energy Research and Development Administration 209, 372, 447
- U. S. Environmental Protection Agency 300
- U. S. ERDA 653
- U.S. Atomic Energy Comm. Div. App. Tech. 254
- U.S. Atomic Energy Commission: ERDA 473
- U.S. Bureau of Mines 200

U.S. Department of Energy 34, 77, 86, 101, 124, 126, 150, 158, 175, 233,
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