



UTAH

10/10/86

WR

Orig. Contr.

Mod. 1

Total

Date

6101

6140

1) 5,009.34 ✓

0

5,009.34

12/19/84

2) 11,086.96 ✓

0

11,086.96

3/28/85

3) 9,671.10 ✓

0

9,671.10

5/24/85

4) 5,276.50 ✓

0

5,276.50

8/13/85

5) 10,786.73 ✓

0

10,786.73

8/14/85

6) 0

15,329.97 ✓

15,329.97

11/21/85

7) 21,672.53 ✓

1,037.34 ✓

22,709.87

1/29/86

8) 0

19,325.21 <sup>USGS??</sup>

19,325.21

~~4/23/86~~

9) 0

6,829.30 ✓

6,829.30

4/23/86

10) 0

9,620.01 ✓

9,620.01

6/19/86

11) 0

4,455.35 ✓

4,455.35

6/30/86

① 63,503.16

② 56,596.68

③ 120,099.84

123,000.

-120,099.84

④ 2,900.16



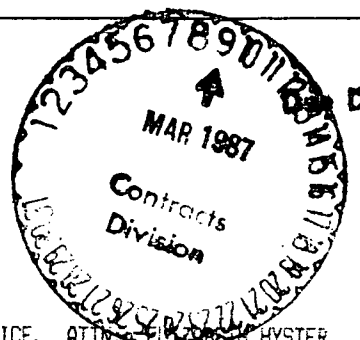
STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES

Prompt Payment Act

Yes

No

3/16/87  
Km  
3/16/87



Date \_\_\_\_\_

Remit to

Utah Geological and Mineral Survey  
606 Black Hawk Way  
Salt Lake City, UT 84108-1280

Invoice No.

6100955

Net 30 days

Bill to

DEPARTMENT OF ENERGY, IDAHO OPERATIONS OFFICE, ATTN: \_\_\_\_\_  
Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Contract No. \_\_\_\_\_

GRANT DE-F607-84ID12543  
GEOTHERMAL ASSESSMENT OF WASHINGTON COUNTY, UTAH

Description: EXPENDITURES FOR PERIOD JUL 1, 1986 THROUGH NOV 30, 1986

	U. G. M. S.	D. O. E.
SALARY & LABOR JUL. - NOV.	2770.34	4583.58
TOTAL	2770.34	4583.58
E & A 35.70%	989.01	1636.34
CURRENT EXP. JUL. -- NOV.	1187.87	1135.46
TOTAL	1187.87	1135.46
TRAVEL JUL. - NOV.	0.00	0.00
COMPUTERS	0.00	0.00
	0.00	0.00
TOTAL EXPENSE	4947.22	7255.40
LESS CREDIT OF		4455.35
		2900.05

Work covered by this invoice was performed satisfactorily to the best of my knowledge.

Approved by: \_\_\_\_\_

Technical Monitor

Date: 3/18/87

Total Invoiced \$ 2900.05  
Less Amount Withheld \$ \_\_\_\_\_  
Total Approved Payment \$ 2900.05 ✓

CMD Authorized Signiture \_\_\_\_\_ Date \_\_\_\_\_

Final Payment

6132	3010	NGEHWS	2900.05
Gwen Anderson			02-20-87

Howard,  
2900.05 is correct.

Total Due \$ 2,900.05 ✓

Credit to	Org.	Acct.	Task	Opt.	Activity
	6132	3010		NGEHW6	2,900.05

Prepared by Gwen Anderson

Date 2-20-87

WHITE — Customer CANARY — Return with Payment PINK — Accounts Receivable GOLDENROD — File

# UURI

EARTH SCIENCE LABORATORY  
391 CHIPETA WAY, SUITE C  
SALT LAKE CITY, UTAH 84108-1295  
TELEPHONE 801-524-3422

February 5, 1986

## MEMORANDUM

TO: Don Mabey, Karen Budding

FROM: Duncan Foley

SUBJECT: Review of UGMS report on Sevier Geothermal Area

I have reviewed the draft copy of your report on the high-temperature geothermal potential of Utah. I have enclosed my copy with specific comments in the margins, and have several additional comments I would like to make.

My overall impression of this report is that you have done a good job of compiling data, and certainly have met the requirements of your contract. As a reviewer, however, I would like to see more integration of the diverse sets of data you have compiled, in order to present a more comprehensive model of the individual geothermal systems. You briefly comment on the importance of steep normal faults rather than listric faults in controlling the distribution of thermal systems, but do not discuss this relationship in your analysis of exploration techniques. I feel that such a discussion should be included.

The section on geochemistry is not integrated with the discussions of systems, instead USGS data are relied upon when UGMS data in your own report would be perfectly adequate. I feel that this sells your own effort short, and could lead to much page turning by a reader to find out all the data you have for each area.


My personal impression is that you have relied too much on data in the professional paper by Rush. Although this paper has a publication date of 1983, it is worth noting that it was written much sooner. Rush has only 1 publication referenced from 1979, one from 1978, and five from 1977, and he refers to April, 1977 as the current date. This means that Rush has missed much data in these areas, and figures you have adapted from his work (e.g., heat flow at Newcastle, etc.) do not reflect the 1986 state of knowledge that your paper should have.

In many cases you have compiled data, but I would appreciate more insight into the meaning of the data from your expertise in the field. The gas analyses are one example of this. What do they mean in terms of high-temperature geothermal systems? How do they compare with results of gas analyses from other Basin and Range or high-temperature geothermal systems?

I feel that Jim should look this paper over carefully as there are many places that I was confused by either sentence or paragraph structure. Clarification of style will aid in clarity of scientific data presentation.

The final copy of this report will need to have an appropriate title page and DOE acknowledgements. It will also need to have the NTIS instructions.

I hope that my comments are useful. I feel that this paper will be an extremely valuable contribution to our understanding of high-temperature geothermal systems in Utah. It will be an important reference for many years to come, and I look forward to having a copy on my bookshelf. Please do not hesitate to call me if I can be of any assistance.

A handwritten signature in cursive script, appearing to read "D. W. Johnson", is written over a horizontal line. The signature is positioned to the left of a vertical line that runs down the right side of the page.

DF/jp

U.S. DEPARTMENT OF ENERGY  
**NOTICE OF FINANCIAL ASSISTANCE AWARD**  
(See Instructions on Reverse)

85 5081

Under the authority of Public Law 93-410 and  
subject to legislation, regulations and policies applicable to (cite legislative program title):  
Geothermal RD&D Act of 1977

1. PROJECT TITLE <u>Geothermal Studies in Utah</u>		2. INSTRUMENT TYPE <input checked="" type="checkbox"/> GRANT <input type="checkbox"/> COOPERATIVE AGREEMENT	
3. RECIPIENT (Name, address, zip code, area code and telephone no.) <u>State of Utah, Utah Geological &amp; Mineral Survey, 606 Black Hawk Way, Salt Lake City UT 84108</u>		4. INSTRUMENT NO. <u>DE-FG07-84ID12543</u>	5. AMENDMENT NO. <u>--</u>
8. RECIPIENT PROJECT DIRECTOR (Name and telephone No.) <u>Don R. Maybe                      801-581-6831</u>		6. BUDGET PERIOD FROM: <u>9/26/84</u> THRU: <u>9/26/85</u>	7. PROJECT PERIOD FROM: <u>9/26/84</u> THRU: <u>9/26/85</u>
9. RECIPIENT BUSINESS OFFICER (Name and telephone No.) <u>Carl Jacobs                      801-581-6831</u>		10. TYPE OF AWARD <input checked="" type="checkbox"/> NEW <input type="checkbox"/> CONTINUATION <input type="checkbox"/> RENEWAL <input type="checkbox"/> REVISION <input type="checkbox"/> SUPPLEMENT	
11. DOE PROJECT OFFICER (Name, address, zip code, telephone No.) <u>R. Eldon Bray, DOE-ID 550 Second Street Idaho Falls, ID 83401                      208-526-0086</u>		12. ADMINISTERED FOR DOE BY (Name, address, zip code, telephone No.) <u>E. M. Hyster, DOE-ID 550 Second Street Idaho Falls, ID 83401                      208-526-1229</u>	

13. RECIPIENT TYPE  
 STATE GOVT     INDIAN TRIBAL GOVT     HOSPITAL     FOR PROFIT ORGANIZATION     INDIVIDUAL  
 LOCAL GOVT     INSTITUTION OF HIGHER EDUCATION     OTHER NONPROFIT ORGANIZATION     C     P     SP     OTHER (Specify)

14. ACCOUNTING AND APPROPRIATIONS DATA				15. EMPLOYER I.D. NUMBER/SSN
a. Appropriation Symbol <u>89X0224.91</u>	b. B & R Number <u>AM1510000</u>	c. FT/AFP/OC <u>ID-44-91/250</u>	d. CFA Number	

16. BUDGET AND FUNDING INFORMATION	
a. CURRENT BUDGET PERIOD INFORMATION	b. CUMULATIVE DOE OBLIGATIONS
(1) DOE Funds Obligated This Action                      \$ <u>83,000</u>	(1) This Budget Period [Total of lines a.(1) and a.(3)]                      \$ <u>83,000</u>
(2) DOE Funds Authorized for Carry Over                      \$ <u>-0-</u>	(2) Prior Budget Periods                      \$ <u>-0-</u>
(3) DOE Funds Previously Obligated in this Budget Period                      \$ <u>-0-</u>	(3) Project Period to Date [Total of lines b. (1) and b. (2)]                      \$ <u>83,000</u>
(4) DOE Share of Total Approved Budget                      \$ <u>83,000</u>	
(5) Recipient Share of Total Approved Budget                      \$ <u>-0-</u>	
(6) Total Approved Budget                      \$ <u>83,000</u>	

17. TOTAL ESTIMATED COST OF PROJECT \$ \_\_\_\_\_  
(This is the current estimated cost of the project. It is not a promise to award nor an authorization to expend funds in this amount.)

18. AWARD/AGREEMENT TERMS AND CONDITIONS  
This award/agreement consists of this form plus the following:

a. Special terms and conditions (if grant) or schedule, general provisions, special provisions (if cooperative agreement)  
b. Applicable program regulations (specify) N/A (Date) \_\_\_\_\_

c. DOE Assistance Regulations, 10 CFR Part 600, as amended, Subparts A and  B (Grants) or  C (Cooperative Agreements).

d. Application/proposal dated 6/5/84,  as submitted  with changes as negotiated

19. REMARKS  
This Grant consists of this NFAA, Part I - Budget Plan, Part II - Conditions, Part III - Statement of Work. The DOE Financial Assistance Rules (10CFR Part 600), OMB Circular A-102, and OMB Circular A-87, are incorporated by reference and attached hereto.

20. EVIDENCE OF RECIPIENT ACCEPTANCE <u>[Signature]</u> (Signature of Authorized Recipient Official) <u>[Date]</u> _____ (Name) _____ (Title)	21. AWARDED BY <u>[Signature]</u> (Signature) <u>[Date]</u> (Date) <u>W. C. Drake</u> (Name) <u>Contracting Officer</u> (Title)
---	--

Grant No. DE-FG07-84ID12543

Part I - Budget Plan

Page 1 of 1

Grantee: State of Utah

BUDGET PLAN

Salaries	\$ 37,205
Fringe Benefits	11,162
Travel	5,580
Publications	6,582
Other	3,801
G & A	18,670
	<hr/>
Total	\$ 83,000
	<hr/>



STATE OF UTAH  
NATURAL RESOURCES  
Utah Geological & Mineral Survey

606 Black Hawk Way • Salt Lake City, UT 84108 • 801-581-6831

Scott M. Matheson, Governor  
Temple A. Reynolds, Executive Director  
Genevieve Atwood, State Geologist

June 5, 1984

Eldon Bray  
U.S. Department of Energy  
550 Second Street  
Idaho Falls, Idaho 83401

Dear Eldon:

Enclosed are the resume and map you requested relative to the geothermal proposal.

The amount for supplies and miscellaneous includes the following:

Although the overhead charge includes all costs for use of UGMS computer, plotter and digitizer it does not include the cost of computer supplies. Several existing digital files of geophysical and geochemical data will be duplicated and other files will be generated. The required tapes and disks must be purchased. All other computer supplies must be purchased. Several existing large maps, well logs and geologic and geophysical sections will be duplicated as well as unpublished reports. Several special base maps on stable mylar will be prepared for use in compilation. Sample bottles will be required for water samples.

If you need more information, please contact me.

Sincerely,

Don R. Mabey  
Senior Geologist

DRM/rd  
Enclosures

RECEIVED

JUN 7 1984

ADVANCED TECHNOLOGY  
BRANCH



NAME: DON R. MABEY  
TITLE: Senior Geologist (Applied Geology)

EDUCATION:  
University of Utah, B.S. Physics

EMPLOYMENT HISTORY:

1982-Present	Utah Geological and Mineral Survey	Senior Geologist
1978-1982	U.S. Geological Survey	Geophysicist
1975-1978	U.S. Geological Survey	Deputy Office Chief
1972-1975	U.S. Geological Survey	Geophysicist
1966-1972	U.S. Geological Survey	Branch Chief
1952-1966	U.S. Geological Survey	Physicist & Geophysicist
1951-1952	Phillips Petroleum	Technical Trainee

MEMBERSHIPS:

Geological Society of America (Fellow)  
American Geophysical Union  
Society of Exploration Geophysicists  
Utah Geological Association

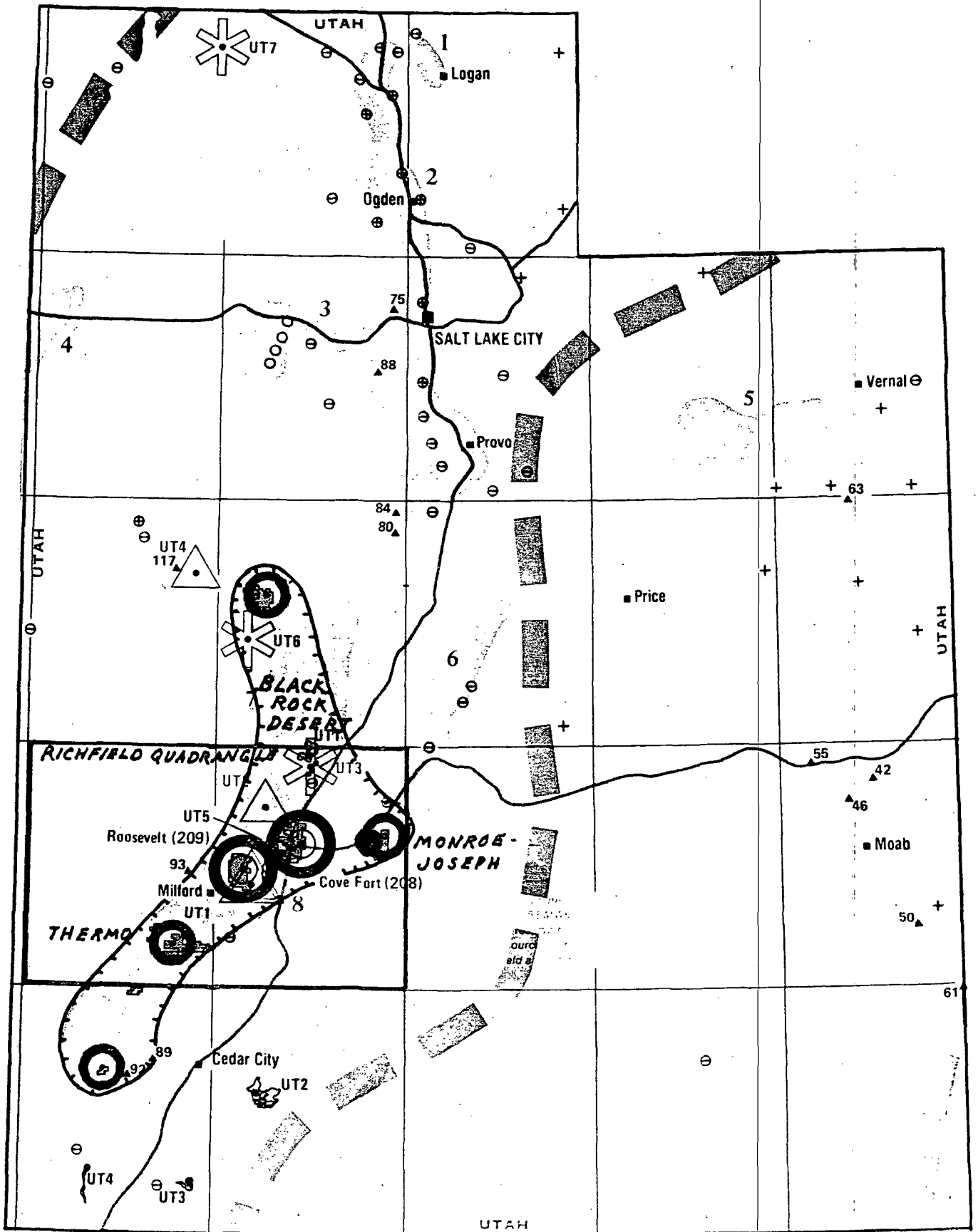
EXPERIENCE:

As Senior Geologist for Applied Geology, Don MabeY manages the Applied Geology Program of the Utah Geological Survey. The two sections involved in the program (Geologic Hazards and Site Investigations) conduct a diverse program of identifying and mapping geologic hazards in Utah and engineering geologic studies designed to protect the welfare of the residents of Utah. In addition, he directs projects concerned with determining the geologic suitability of sites in Utah for disposal of high level radioactive waste, coordinates the UGMS earthquake and geothermal resources studies programs, and carries on a program of personal research directed toward the goals of the Applied Geology Program.

With the U.S. Geological Survey, Mr. MabeY was involved in a program applying techniques of geophysical exploration to the investigation of a wide range of geologic problems. These included mineral, geothermal, and petroleum resource studies, regional tectonic studies, and engineering geologic investigations. As Chief of the Branch of Regional Geophysics, he was responsible for developing and managing major parts of the USGS geophysical programs. He also coordinated several large multi-discipline programs of resource and regional geologic studies.

Mr. MabeY received the Department of Interior Meritorious Service Award in 1972, and the Department of Interior's highest award, the Distinguished Service Award in 1979.

Mr. MabeY developed and directed the geophysical phase of the evaluation of the resource in Known Geothermal Resource Areas. He coordinated the USGS resource investigation of the Raft River geothermal area and coordinated the Federal-State investigation of the geothermal resources of the Snake River Plain. He was a member of the USGS team that prepared the most recent appraisal of the geothermal resources of the United States.



MAP OF UTAH SHOWING AREA OF PROPOSED GEOTHERMAL STUDY

UNIVERSITY OF UTAH RESEARCH INSTITUTE

**UURI**

ENVIRONMENTAL STUDIES LABORATORY  
391 CHIPETA WAY, SUITE D  
SALT LAKE CITY, UTAH 84108-1295  
TELEPHONE: 801-524-3460

MEMORANDUM

May 9, 1984

TO: Eldon Bray  
FROM: Duncan Foley  
SUBJECT: Utah project

I have enclosed a draft copy of both a technical evaluation and a suggested statement of work for the new proposal. I have discussed this proposal with Don Mabey, but there are several areas that may need to be followed up.

I suggest that you get a written statement from UGMS indicating that Don Mabey is the senior geologist identified in this project. A copy of Don's resume should also be in DOE files, I feel. The second geologist is not yet identified, although Don hopes to obtain a person with experience in volcanology and geothermal systems. The success of task 3 may be, to some extent, dependant upon UGMS retaining this specific person.

On task 1, the "free" may need to be defined or deleted in regards to distribution. UGMS should probably be able to recover postage and handling costs for distribution beyond over-the-counter hand outs.

Don recognizes that the task 2 bibliography may require compilation in addition to pulling references from the computer. If Ben is going to be

providing background information for this task, this may need to be specified in the statement of work. The scope and comprehensiveness of this bibliography need to be settled prior to Don's starting work.

Task 3 is fairly open-ended, as Don is presently not sure exactly what results will be obtained from the data integration and their further field work. I feel that the presence of Don on this project will insure a quality product. He will emphasize the high temperature systems in the area, including Cove Fort, Roosevelt Hot Springs, and the Black Rock Desert area, north to Fumerole Butte. UGMS is not very specific about the nature of field work in this task, some further information might be appropriate.

*Duncan*

---

DF/cd



STATE OF UTAH  
 NATURAL RESOURCES  
 Utah Geological & Mineral Survey

Scott M. Matheson, Governor  
 Temple A. Reynolds, Executive Director  
 Genevieve Atwood, State Geologist

606 Black Hawk Way • Salt Lake City, UT 84108 • 801-581-6831

February 22, 1984

Eldon Bray  
 U.S. Department of Energy  
 550 Second Street  
 Idaho Falls, Idaho 83401

Dear Eldon:

Following is an outline of a proposal for a one-year project of geothermal resource related work in Utah to be done by the Utah Geological and Mineral Survey (UGMS) with funding support from the Department of Energy:

1. Printing and free distribution of 1000 copies of "A Guide to Geothermal Energy"
2. Preparation and publication of a manuscript containing: (1) bibliography of publications with information relating to geothermal resources of Utah with annotations on publications with important geothermal resource significance. (Using recently completed computerized bibliography of Utah geology, nearly all publications with any information relating to temperature or heat can be identified. However, it is proposed to prepare annotations for only those with information of major importance to geothermal resources.) (2) list and description of geothermal projects in Utah conducted by or for government agencies or by universities and a description of commercial geothermal developments.
3. Study of high-temperature geothermal resources in southcentral Utah related to igneous systems. Five of the six known hydrothermal convection systems in Utah with calculated reservoir temperature greater than 150°C are in a west-trending belt of Cenozoic igneous rocks. The U.S. Geological Survey (USGS) is nearing completion of a major study of mineral resources of the Richfield 1 x 2 degree quadrangle, which contains these five geothermal systems. The USGS study has produced considerable new data on the geology, geochemistry, and geophysics of the quadrangle with particular emphasis on the Cenozoic

Cost

\$3,000

\$10,000

*Ab-on SOW will include outline of DOE to produce*

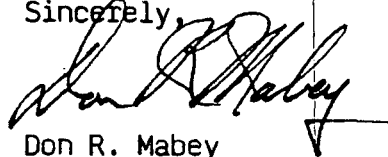
igneous rocks. Two former USGS personnel, who worked on the project, are now working for the UGMS. The UGMS proposes to use the new USGS data along with existing data on the five known geothermal systems as the foundation of a study of the relationship between high-temperature geothermal resources in the quadrangle and Cenozoic igneous systems. The study which will include field and laboratory investigations will have the objective of obtaining a better understanding of the known geothermal systems, providing an indication of where other systems may exist and estimating the total high-temperature resource of the area.

\$70,000

TOTAL

\$83,000

Sincerely,



Don R. Mabey  
Senior Geologist

DRM/co

RECEIVED

SEP 27 1984

ADVANCED TECHNOLOGY  
BRANCH

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

AMENDMENT/MODIFICATION NO. M008	2. EFFECTIVE DATE 6/30/84	3. REQUISITION/PURCHASE REQUEST NO. 07-85ID12016.501	4. PROJECT NO. (If applicable)
ISSUED BY S. Department of Energy Operations Office 550 Second Street Idaho Falls, ID 83401	CODE	6. ADMINISTERED BY (If other than block 5)	CODE

CONTRACTOR NAME AND ADDRESS State of Utah, Division of Water Rights 825 North Third West, Suite 150 Salt Lake City, UT 84103 ATTN: Stanley Green	CODE	FACILITY CODE	8. AMENDMENT OF SOLICITATION NO. <input type="checkbox"/>
			DATED (See block 9)
			<input checked="" type="checkbox"/> MODIFICATION OF CONTRACT/ORDER NO. DE-FC07-79ID12016
			DATED 4/16/79 (See block 11)

THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in block 12. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offerors must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended, by one of the following methods:

(a) By signing and returning \_\_\_\_\_ copies of this amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If, by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

9. ACCOUNTING AND APPROPRIATION DATA (If required)

N/A

THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS

(a)  This Change Order is issued pursuant to \_\_\_\_\_  
The Changes set forth in block 12 are made to the above numbered contract/order.

(b)  The above numbered contract/order is modified to reflect the administrative changes (such as changes in paying office, appropriation data, etc.) set forth in block 12.

(c)  This Supplemental Agreement is entered into pursuant to authority of Changes Clause  
It modifies the above numbered contract as set forth in block 12.

DESCRIPTION OF AMENDMENT/MODIFICATION

(a) Article V TERM OF AGREEMENT, is revised to change the period of performance

FROM: June 30, 1984

TO: December 31, 1984

Except as provided herein, all terms and conditions of the document referenced in block 8, as heretofore changed, remain unchanged and in full force and effect.

CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT  CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN 3 COPIES TO ISSUING OFFICE

NAME OF CONTRACTOR/OFFEROR <u>Dee C. Hansen</u> (Signature of person authorized to sign)	17. UNITED STATES OF AMERICA BY <u>William C. Drake</u> (Signature of Contracting Officer)		
NAME AND TITLE OF SIGNER (Type or print) Dee C. Hansen, P.E. State Engineer	16. DATE SIGNED 12/28/84	18. NAME OF CONTRACTING OFFICER (Type or print) William C. Drake Contracting Officer	19. DATE SIGNED 1/3/85



STATE OF UTAH  
NATURAL RESOURCES  
Utah Geological & Mineral Survey

Norman H. Bangerter, Governor  
Dee C. Hansen, Executive Director  
Genevieve Atwood, State Geologist

606 Black Hawk Way · Salt Lake City, UT 84108-1280 · 801-581-6831

September 5, 1985

Ms. Peggy Brookshier  
Department of Energy  
785 DOE Place  
Idaho falls, ID 83402

RE: Grant No. DE-FG07-84ID12543 - Geothermal Studies in Utah

Dear Ms. Brookshire:

It is requested the subject agreement be extended until January 31, 1986 at no cost to the Department of Energy.

The Utah Geological and Mineral Survey has completed the manuscript described in Task 1 and will shortly submit the manuscript for DOE review. The manuscript described in Task 2 will be completed within a month and also submitted for DOE review. The no cost extension will provide time for the publication of these two products.

Sincerely,

A handwritten signature in cursive script, appearing to read "Don R. Mabey".

Don R. Mabey  
Deputy Director

DRM/bl

cc: ✓ Duncan Folley  
Genevieve Atwood  
Gwen Anderson



CONTRACT DELIVERABLES

ORGANIZATION Utah Geological and Mineral Survey

PRINCIPAL CONTACT Don Mabey

PHONE 801-581-6831

CONTRACT NO. DE-FG07-84ID12543

COMPLETION DATE 9-26-85

ORIG. \$	OBLIGATED	PAID	RETAINED	REMAINING	NOTES
DOE	\$83,000			57,233	1, 2
STATE	0			0	

\$ DATA UPDATED 7-31-85

- NOTES
1. Quarterly report through June 1985 shows expenditures of \$38K, versus planned expenditures of \$52K.
  2. Three invoices for \$25,767 have been received, as of May 23, 1985.

CONTRACT START  
Original 9-26-84

- TASKS
1. annotated bibliography of geothermal resources in Utah, including descriptions of geothermal projects and developments
  2. study high-temperature geothermal systems in the Richfield 2 degree quad area
  3. management

COMMENTS 4-29-85

References for bibliography have been collected, and annotations are being made. USGS has reviewed the references. Compilation of projects has begun. Draft copies of maps for high temperature regional study have been made, and arrangements to compile new geologic data at Cove Fort are underway.

TASK	DELIVERABLES	DATE DUE	REC'D
1	publish bibliography and descriptions of projects	9-26-85	
2	report including maps and data tables, which will discuss igneous and tectonic events of last 30 million years, current geophysical and geochemical	9-26-85	

Utah Geological and Mineral Survey

TASK	DELIVERABLES	DATE DUE	REC'D
2, cont.	anomalies, source of heat and structural controls of present geothermal systems, exploration strategies, and probability of undiscovered systems		
1,2	draft final reports	8-12-85	
3	quarterly reports	1-15-85	1-14-85
		4-15-85	4-15-85
		7-15-85	7-5-85

# UURI

EARTH SCIENCE LABORATORY  
391 CHIPETA WAY, SUITE C  
SALT LAKE CITY, UTAH 84108-1295  
TELEPHONE 801-524-3422

## M E M O R A N D U M

TO: Arch<sup>ie</sup> Smith  
FROM: Duncan Foley  
SUBJECT: Review of Karin Budding's Report  
DATE: August 4, 1986

Attached please find my review copy of "Low-temperature geothermal assessment of the Santa Clara and Virgin River Valleys, Washington County, Utah." I have made some comments on the text, and have a few below. Overall I like the report, and I think that it will be a valuable contribution to understanding these low-temperature areas.

My review is incomplete. I did not review the tables in detail, did not verify that all the data in the text and tables agree (e.g., pH at Pah Tempe is different in text and table), did not recalculate a few points on the piper plots to make sure that they are correct (no drafting errors, etc.), and did not review the large maps in detail. Data points on the maps need to be verified that they are properly plotted (e.g., TG6 is in section 7 in the location given on the table, but is in section 8 on the map).

I have noted a few places where I was confused by the writing style. As a reader of a scientific document, it would help me if fewer colloquial phrases were used. I also got lost in a few "dog-leg" sentences, which joined separate thoughts in one phrase. I have noted some of these in the text.

There are a few places where I would like to know more about your interpretations of the data. Why rely on Mundorff (1970) as a source for saying that the origin of high TDS fluids in Pah Tempe Springs is unknown? I would suggest that you look at the local stratigraphy for possible origins. The waters qualitatively look like they might have equilibrated with the gypsum in the Toroweap; this needs to be quantitatively confirmed. Why do you think that the chemistry of Pah Tempe has changed?

It would help me if the captions on the figures were more descriptive. I particularly got lost on the piper plots. Perhaps you could include a map indicating where the various geographic divisions are located.

Your contract calls for the development of a resource model. This should

be an integration and interpretation of all the compiled and new data, and should include your best thoughts about the origin, circulation paths, and geologic controls on the systems. For instance, volcanic heat is excluded in the current conclusion as a temperature source for the geothermal systems, but the new thermal gradient data are not integrated to explain the heat. The individual parts of a model are in your report, they just need to be integrated into a complete picture. It would also help to have a drawing of your conceptual model.

I feel that this is a good draft. I look forward to the final report, as it will be an important step in our understanding St. George area geothermal resources. Please do not hesitate to call me if you have any questions.



---

DF:leo

**NOTICE OF FINANCIAL ASSISTANCE AWARD**  
(See Instructions on Reverse)

*H. Foley*

Under the authority of Public Law 93-410 and subject to legislation, regulations and policies applicable to (cite legislative program title):  
**Geothermal RD&D Act of 1977**

<b>1. PROJECT TITLE</b> Geothermal Assessment of Washington County, UT	<b>2. INSTRUMENT TYPE</b> <input checked="" type="checkbox"/> GRANT <input type="checkbox"/> COOPERATIVE AGREEMENT
<b>3. RECIPIENT (Name, address, zip code, area code and telephone no.)</b> Utah Geological and Mineral Survey 606 Blackhawk Way Salt Lake City, UT 84108	<b>4. INSTRUMENT NO.</b> DE-FG07-84ID12543
<b>8. RECIPIENT PROJECT DIRECTOR (Name and telephone No.)</b> Raymond L. Kearns, Jr. (801) 581-6831	<b>5. AMENDMENT NO.</b> A001
<b>9. RECIPIENT BUSINESS OFFICER (Name and telephone No.)</b> Genevieve Atwood (801) 581-6831	<b>6. BUDGET PERIOD</b> FROM: 9/26/85 THRU: 11/30/86
<b>11. DOE PROJECT OFFICER (Name, address, zip code, telephone No.)</b> Peggy A. M. Brookshier, DOE-ID 785 DOE Place Idaho Falls, ID 83402	<b>7. PROJECT PERIOD</b> FROM: 9/26/84 THRU: 11/30/86
<b>13. RECIPIENT TYPE</b> <input checked="" type="checkbox"/> STATE GOV'T <input type="checkbox"/> INDIAN TRIBAL GOV'T <input type="checkbox"/> HOSPITAL <input type="checkbox"/> FOR PROFIT ORGANIZATION <input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> LOCAL GOV'T <input type="checkbox"/> INSTITUTION OF HIGHER EDUCATION <input type="checkbox"/> OTHER NONPROFIT ORGANIZATION <input type="checkbox"/> C <input type="checkbox"/> P <input type="checkbox"/> SP <input type="checkbox"/> OTHER (Specify)	<b>10. TYPE OF AWARD</b> <input type="checkbox"/> NEW <input type="checkbox"/> CONTINUATION <input type="checkbox"/> RENEWAL <input checked="" type="checkbox"/> REVISION <input type="checkbox"/> SUPPLEMENT
<b>12. ADMINISTERED FOR DOE BY (Name, address, zip code, telephone No.)</b> Ronald A. King Department of Energy Idaho Operations Office 785 DOE Place Idaho Falls, ID 83402	

<b>14. ACCOUNTING AND APPROPRIATIONS DATA</b>	<b>15. EMPLOYER I.D. NUMBER/SSN</b>								
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:25%;">a. Appropriation Symbol</td> <td style="width:25%;">b. B &amp; R Number</td> <td style="width:25%;">c. FT/AFP/OC</td> <td style="width:25%;">d. CFA Number</td> </tr> <tr> <td>89X0224.91</td> <td>AM1510000</td> <td>ID-54-91/410</td> <td></td> </tr> </table>	a. Appropriation Symbol	b. B & R Number	c. FT/AFP/OC	d. CFA Number	89X0224.91	AM1510000	ID-54-91/410		
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89X0224.91	AM1510000	ID-54-91/410							

<b>16. BUDGET AND FUNDING INFORMATION</b>	
<b>a. CURRENT BUDGET PERIOD INFORMATION</b>	<b>b. CUMULATIVE DOE OBLIGATIONS</b>
(1) DOE Funds Obligated This Action      \$ 40,000	(1) This Budget Period      \$ 40,000 [Total of lines a.(1) and a.(3)]
(2) DOE Funds Authorized for Carry Over      \$ 41,140	(2) Prior Budget Periods      \$ 83,000
(3) DOE Funds Previously Obligated in this Budget Period      \$ -0-	(3) Project Period to Date      \$ 123,000 [Total of lines b. (1) and b. (2)]
(4) DOE Share of Total Approved Budget      \$ 81,140	
(5) Recipient Share of Total Approved Budget      \$ 10,005	
(6) Total Approved Budget      \$ 91,145	

**17. TOTAL ESTIMATED COST OF PROJECT**    \$ 133,005  
 (This is the current estimated cost of the project. It is not a promise to award nor an authorization to expend funds in this amount.)

**18. AWARD/AGREEMENT TERMS AND CONDITIONS**

This award/agreement consists of this form plus the following:

a. Special terms and conditions (if grant) or schedule, general provisions, special provisions (if cooperative agreement)

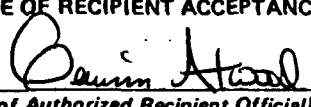
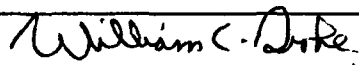
b. Applicable program regulations (specify) \_\_\_\_\_ (Date) \_\_\_\_\_

c. DOE Assistance Regulations, 10 CFR Part-600, as amended, Subparts A and  B (Grants) or  C (Cooperative Agreements).

d. Application/proposal dated 5/15/85  as submitted  with changes as negotiated Made on 9/16/85

**19. REMARKS**

This modification increases the scope by adding additional work as described in the Statement of Work (Part III.a), increases the fundings as provided in the revised Budget Plan (Part I) and defines the grantees cost participation.

<b>20. EVIDENCE OF RECIPIENT ACCEPTANCE</b>  _____ (Signature of Authorized Recipient Official)      9/29/85 _____ Genevieve Atwood      (Date) _____ Director, UGMS      (Name) _____ (Title)	<b>21. AWARDED BY</b>  _____ William C. Drake      9/24/85 _____ (Signature)      (Date) _____ Contracting Officer _____ (Name)      (Title)
--	--

*Additional signatures other side*

Grant No. DE-FG07-84ID12543  
Modification A001  
Part I - Budget Plan  
Page 1 of 1

Grantee: State of Utah

BUDGET PLAN

	<u>9/26/84 to 9/26/85</u> DOE	<u>9/26/85 to 11/30/86</u> DOE	<u>Grantee</u>
Salaries	\$22,975	\$31,294	\$ 2,980
Fringe Benefits	6,336	10,156	758
Equipment	-0-	-0-	5,000
Travel	266	11,672	-0-
Publication	-0-	6,582	-0-
Other	969	6,488	-0-
G & A	<u>11,314</u>	<u>14,948</u>	<u>1,267</u>
Total	<u>\$41,860</u>	<u>\$81,140</u>	<u>\$10,005</u>

The Grantee will provide the Project Manager, Principal Investigator, and equipment required to accomplish the work defined under Attachment A.1 (Statement of Work) at no cost to the Government. The estimated cost for the services and equipment is \$10,005.

STATEMENT OF WORK

UTAH GEOLOGICAL AND MINERAL SURVEY

In the Santa Clara and Virgin River Valleys and surrounding terrain of Washington County, Utah, accomplish the following tasks:

- Task 1. Conduct a literature search to compile data on the geologic, geochemical, geophysical, and hydrologic environments of Washington County. Include in this compilation records from available water and petroleum wells.
- Task 2. Contact appropriate federal agencies (e.g. USGS, USBLM, USFS, etc.), local government entities, state agencies, and private industry sources to obtain published and unpublished data pertinent to the exploration for geothermal resources.
- Task 3. Integrate and interpret the existing data base compiled in Tasks 1 and 2 and develop a conceptual model for geothermal resources. Identify gaps in the data base, and develop a field program to provide data required to refine the model and verify data.
- Task 4. Conduct a field program of well and spring temperature measurements, obtain thermal gradients in appropriate available wells, and sample for and carry out (as funds permit) geochemical analyses of all thermal waters identified and selected non-thermal waters. If appropriate, and time and funding permit, field work could also include geological mapping, new geophysical data gathering, and further hydrologic investigations.
- Task 5. Integrate new data with the compiled data and refine the model of geothermal resources developed in task 3. Develop an assessment of geothermal resource potential in the study area.
- Task 6. Prepare and publish a report which will include the new and compiled data, the resource model, and the resource assessment.
- Task 7. Provide overall project management and complete and report on tasks in a timely manner. Management reports shall be provided as defined by the attached DOE Form EIA 459A - Reporting Requirements Checklist. The original Final Report for this grant will be due on the original due date. The required reports are also summarized as follows:

	<u>REPORT</u>	<u>DUE</u>
(1)	Form DOE 538 Notice of Energy RD&D	30 days after award of grant
(2)	Quarterly Management Summary Report	15 days after calendar quarter end
(3)	Project Status Report	15 days after calendar quarter end
(4)	Phase I Final Report (Draft)	Due 45 days prior to original completion date
(5)	Phase I Final Report	Due on original completion date
(6)	Final Report (Draft)	Due 45 days prior to updated completion date
(7)	Final Report	Due on updated completion date
(8)	Financial Status Report - OMB Form 269	Due annually and upon completion

The deliverables resulting from the tasks outlined above which will be delivered to DOE are summarized as follows:

1. The original Final Report (herein referred to as Phase I Final Report) and the Final Report for this addition to the grant--one camera-ready copy plus sixteen additional copies--will be distributed as specified in the attached DOE Form EIA 459A.
2. Reports previously described under Task 8 above will be prepared and issued in the amounts and at the frequency shown.



**U.S. DEPARTMENT OF ENERGY  
FEDERAL ASSISTANCE REPORTING CHECKLIST**

FORM EIA-459A  
(10/80)

FORM APPROVED  
OMB NO. 1900-0127

<b>1. Identification Number:</b> DE-FG07-841D12543	<b>2. Program/Project Title:</b> Geothermal Resource Assessment																																				
<b>3. Recipient:</b> State of Utah, Utah Geological and Mineral Survey																																					
<b>4. Reporting Requirements:</b>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:50%;">Frequency</th> <th style="width:25%;">No. of Copies</th> <th style="width:25%;">Addressees</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="padding: 5px;"><b>PROGRAM/PROJECT MANAGEMENT REPORTING</b></td> </tr> <tr> <td style="padding: 5px;"><input type="checkbox"/> Federal Assistance Milestone Plan</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;"><input type="checkbox"/> Federal Assistance Budget Information Form</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;"><input checked="" type="checkbox"/> Federal Assistance Management Summary Report</td> <td style="text-align:center;">Q</td> <td style="text-align:center;">1,1,1</td> </tr> <tr> <td style="padding: 5px;"><input checked="" type="checkbox"/> Federal Assistance Program/Project Status Report</td> <td style="text-align:center;">Q</td> <td style="text-align:center;">1,1,1</td> </tr> <tr> <td style="padding: 5px;"><input checked="" type="checkbox"/> Financial Status Report, OMB Form 269</td> <td style="text-align:center;">Y,F</td> <td style="text-align:center;">1</td> </tr> <tr> <td colspan="3" style="padding: 5px;"><b>TECHNICAL INFORMATION REPORTING</b></td> </tr> <tr> <td style="padding: 5px;"><input checked="" type="checkbox"/> Notice of Energy RD&amp;D</td> <td style="text-align:center;">Y</td> <td style="text-align:center;">1,1,1</td> </tr> <tr> <td style="padding: 5px;"><input type="checkbox"/> Technical Progress Report</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;"><input checked="" type="checkbox"/> Topical Report</td> <td style="text-align:center;">A*</td> <td style="text-align:center;">1,1 **,1</td> </tr> <tr> <td style="padding: 5px;"><input checked="" type="checkbox"/> Final Technical Report</td> <td style="text-align:center;">F*</td> <td style="text-align:center;">1,1 **,1</td> </tr> </tbody> </table>	Frequency	No. of Copies	Addressees	<b>PROGRAM/PROJECT MANAGEMENT REPORTING</b>			<input type="checkbox"/> Federal Assistance Milestone Plan			<input type="checkbox"/> Federal Assistance Budget Information Form			<input checked="" type="checkbox"/> Federal Assistance Management Summary Report	Q	1,1,1	<input checked="" type="checkbox"/> Federal Assistance Program/Project Status Report	Q	1,1,1	<input checked="" type="checkbox"/> Financial Status Report, OMB Form 269	Y,F	1	<b>TECHNICAL INFORMATION REPORTING</b>			<input checked="" type="checkbox"/> Notice of Energy RD&D	Y	1,1,1	<input type="checkbox"/> Technical Progress Report			<input checked="" type="checkbox"/> Topical Report	A*	1,1 **,1	<input checked="" type="checkbox"/> Final Technical Report	F*	1,1 **,1
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<b>FREQUENCY CODES AND DUE DATES:</b>  A - As Necessary; within 5 calendar days after events. F - Final; 90 calendar days after the performance of the effort ends. Q - Quarterly; within 30 days after end of calendar quarter or portion thereof. O - One time after project starts; within 30 days after award. X - Required with proposals or with the application or with significant planning changes. Y - Yearly; 30 days after the end of program year. (Financial Status Reports 90 days). S - Semiannually; within 30 days after end of program fiscal half year.																																					
<b>5. Special Instructions:</b>  <p align="center">*Draft Report due 45 days prior to completion date to allow for DOE review and comments and is within the Grant budget period.</p> <p align="center">**Camera ready copy must be included.</p>																																					
<b>6. Prepared by: (Signature and Date)</b>	<b>7. Reviewed by: (Signature and Date)</b>																																				

REPORT DISTRIBUTION LIST

- A. Ronald A. King  
Contracts Management Division  
  
U. S. Department of Energy  
Idaho Operations Office  
785 DOE Place  
Idaho Falls, ID 83402
  
- B. Peggy Brookshier  
Advanced Technology Division  
U. S. Department of Energy  
785 DOE Place  
Idaho Falls, ID 83401
  
- C. Earl G. Jones  
Financial Management Division  
  
U. S. Department of Energy  
Idaho Operations Office  
785 DOE Place  
Idaho Falls, ID 83402
  
- D. Duncan Foley  
  
University of Utah Research Institute  
Earth Science Laboratory  
391 Chipeta Way, Suite C  
Salt Lake City, UT 84108
  
- E. U. S. Department of Energy  
  
Technical Information Center  
P. O. Box 62  
Oak Ridge, TN 37830



STATE OF UTAH  
NATURAL RESOURCES  
Utah Geological & Mineral Survey

Norman H. Bangerter, Governor  
Dee C. Hansen, Executive Director  
Genevieve Atwood, State Geologist

506 Black Hawk Way · Salt Lake City, UT 84108-1280 · 801-581-6831

August 7, 1985

Peggy A.M. Brookshier  
Department of Energy  
Idaho Operations Office  
550 Second Street  
Idaho Falls, ID 83401

RE: Grant #DE-FG07-84ID12543

Dear Ms. Brookshier:

Please find enclosed a form entitled "Assurances," which has been properly executed by the person authorized to do so.

We have recently completed and submitted to the U.S. Department of Interior, Office of the Inspector General, our proposed indirect cost rate for FY 85-86. Enclosed is a copy for your information. Upon receipt of the negotiated rate agreement we will forward a copy to your office.

If you have need of further information, please call me at (801) 581-6831.

Sincerely,

A handwritten signature in cursive script that reads "Gwen Anderson".

Gwen Anderson  
Accountant

GA/bl

Enclosure

RECEIVED

AUG 14 1985

ADVANCED TECHNOLOGY  
BRANCH

## ASSURANCES

Applicant hereby assures that it will comply with the regulations, policies, guidelines and requirements, including the applicable OMB Circulars as they relate to the application, acceptance and use of Federal funds for this federally-assisted project. Also the Applicant assures and certifies that:

1. It possesses legal authority to apply for the grant; that a resolution, motion or similar action has been duly adopted or passed as an official act of the applicant's governing body, authorizing the filing of the application including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.
2. It will comply with Title VI of the Civil Rights Act of 1964 (P.L. 88-352) and in accordance with Title VI of that Act, no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the applicant receives Federal financial assistance and will immediately take any measures necessary to effectuate this agreement.

It will comply with Title VI of the Civil Rights Act of 1964 (42 USC 2000d) prohibiting employment discrimination where (1) the primary purpose of a grant is to provide employment or (2) discriminatory employment practices will result in unequal treatment of persons who are or should be benefiting from the grant-aided activity.

4. It will comply with requirements of the provisions of the uniform Relocation Assistance and Real Property Acquisitions Act of 1970 (P.L. 91-646) which provides for fair and equitable treatment of persons displaced as a result of Federal and federally assisted programs.
5. It will comply with the provisions of the Hatch Act which limit the political activity of employees.
6. It will comply with the minimum wage and maximum hours provisions of the Federal Fair Labor Standards Act, as they apply to hospital and educational institution employees of State and local governings.
7. It will establish safeguards to prohibit emmployees from using their positions for a purpose that is or gives the appearance of being motivated by a desire for private gain for themselves or others, particularly those with whom they have family, business, or other ties.

It will give the sponsoring agency or the Comptroller General through any authorized representative the access to and the right to examine all records, books, papers, or documents related to the grant.

9. It will comply with all requirements imposed by the Federal sponsoring agency concerning special requirements of law, program requirements, and other administrative requirements.
10. It will insure that the facilities under its ownership, lease or supervision which shall be utilized in the accomplishment of the project are not listed on the Environmental Protection Agency's (EPA) list of Violating Facilities and that it will notify the Federal grantor agency of the receipt of any communication from the Director of the EPA Office of Federal Activities indicating that a facility to be used in the project is under consideration for listing by the EPA.
11. It will comply with the flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973, Public Law 93-234, 87 Stat. 975, approved December 31, 1976. Section 102(a) requires, on and after March 2, 1975, the purchase of flood insurance in communities where such insurance is available as a condition for the receipt of any Federal financial assistance for construction or acquisition purposes for use in any area that has been identified by the Secretary of the Department of Housing and Urban Development as an area having special flood hazards.

The phrase "Federal financial assistance" includes any form of loan, grant, guaranty, insurance payment, rebate, subsidy, disaster assistance loan or grant, or any other form of direct or indirect Federal assistance.

12. It will assist the Federal grantor agency in its compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (16 U.S.C. 469a-1 et seq.) by (a) consulting with the State Historic Preservation Officer on the conduct of investigations, as necessary, to identify properties listed in or eligible for inclusion in the National Register of Historic Places that are subject to adverse effects (see 36 CFR Part 800.8) by the activity, and notifying the Federal grantor agency of the existence of any such properties, and by (b) complying with all requirements established by the Federal grantor agency to avoid or mitigate adverse effects upon such properties.

The Applicant certifies that it will comply with the above assurances if the assistance is approved.

Grant Applicant: UTAH GEOLOGICAL & MINERAL SURVEY

Project Title: GEOHERMAL ASSESSMENT OF WASHINGTON COUNTY, UTAH

Certifying Representative: Archie D. Smith  
Signature

ARCHIE D. SMITH, SENIOR GEOLOGIST ECONOMIC PROGRAM  
Name and Title

06 AUGUST 1985  
Date



UTAH GEOLOGICAL AND MINERAL SURVEY  
INDIRECT COST RATE PROPOSAL-SHORT FORM METHOD  
FOR THE FISCAL YEAR ENDED JUNE 30, 1985

	Total Costs Incurred	Excludable Costs	Unallowable Costs	Direct Costs		Indirect Costs
				Salaries & Wages	Other	
FY-84 ACTUALS:						
Administration & Mgt. Support	298,598		547	4,681		293,370
Data Processing	160,357		76,166			84,191
Information	254,158		566	182,332	71,260	
Economic	630,522		8,034	462,951	141,149	18,388
Applied	290,611		1,927	246,136	38,704	3,844
Mapping	324,783		7,294	173,546	143,943	
Total Costs	1,959,029		94,534	1,069,646	395,056	399,793

FY-86 WORK PROGRAM:

Administration & Mgt. Support	355,900		13,500	21,649		320,751
Data Processing	114,311		19,980	11,080		83,251
Information	315,389		8,500	231,069	75,820	-0-
Economic	684,500		29,900	511,901	120,457	22,242
Applied	548,100		10,000	420,132	101,079	16,889
Mapping	400,900		20,000	219,875	161,025	
Total Costs	2,419,100		101,880	1,415,706	458,381	443,133

FY-84 Direct Salaries & Fringe	1,069,646
X FY-84 Negotiated rate	35.3%
Recoverable Indirect Costs	377,586
Less FY-84 Actual Indirect	399,793
FY-84 Underrecovery Carry Forward to 86	-22,207-
FY-82 Underrecovery Carry Forward to 86	-14,334-
Under recovery carry forward	-36,541-

FY-86 Proposed Indirect Costs	443,133
Add: FY-82 & FY-84 Underrecovery Carry Forward	36,541
	479,674

Divide by FY-86 Direct Costs Base	1,415,706
FY-86 Indirect Cost Rate	33.9%



STATE OF UTAH  
NATURAL RESOURCES  
Utah Geological & Mineral Survey

Norman H. Bangerter, Governor  
Dee C. Hansen, Executive Director  
Genevieve Atwood, State Geologist

Black Hawk Way · Salt Lake City, UT 84108-1280 · 801-581-6831

April 19, 1985

Department of Energy  
Idaho Operations Office  
Attn: Mr. Kent Hastings  
R & D Contracts Branch  
Contracts Management Division  
550 Second Street  
Idaho Falls, ID 83401

RE: UGMS Program Proposal - Geothermal Assessment of Washington County, Utah

Dear Mr. Hastings:

Please replace the proposal budget in the subject proposal with the enclosed proposal budget.

Sincerely,

Archie D. Smith  
Senior Geologist

ADS/ay  
enclosure  
cc: Duncan Foley

F. Indirect Cost Rate

30.6% of salaries and benefits calculated in 1984 by the UGMS. This figure will be submitted to the U.S. Department of the Interior, Regional Audit Supervisor; Office of the Inspector General, Western Region; Federal Building, Room W-2400; 2800 Cottage Way, Sacramento, California, 95825, for negotiation.

still wrong, after mtg. c f

PROPOSAL BUDGET

For the year beginning October 1, 1985 and ending September 30, 1986

<u>Budget Category</u>	<u>DOE Funded</u>	<u>UGMS Funded</u>	<u>Total DOE/UGMS</u>
A. Total labor costs including benefits			
1. Project Manager (Archie D. Smith)	\$ -0-	\$ 2,500.00	\$ 2,500.00
2. Principal Investigator (Ray L. Kerns)	-0-	2,500.00	2,500.00
3. Staff Geologist	16,019.00	-0-	16,019.00
4. Geotechnician I	6,379.00	-0-	6,379.00
SUBTOTAL	\$22,398.00	\$ 5,000.00	\$27,398.00
B. Equipment to be acquired	-0-	\$ 5,000.00	\$ 5,000.00
C. Supplies	\$ 550.00	-0-	\$ 550.00
D. Testing	\$ 3,840.00	-0-	\$ 3,840.00
E. Travel			
Mileage	\$ 1,980.00	-0-	\$ 1,980.00
Per diem	4,378.00	-0-	4,378.00
Subtotal	\$ 6,358.00	-0-	\$ 6,358.00
TOTAL DIRECT COSTS (A through D)	\$33,146.00	\$10,000.00	\$43,146.00
F. Indirect Cost Rate (30.6%-1985 rate)	\$ 6,854.00	-0-	\$ 6,854.00
TOTAL COST	\$40,000.00	\$10,000.00	\$50,000.00
Share Percentage	80%	20%	100%



PROGRAM PROPOSAL SUBMITTED TO THE U.S. DEPARTMENT OF ENERGY  
BY  
UTAH GEOLOGICAL AND MINERAL SURVEY  
606 BLACK HAWK WAY  
SALT LAKE CITY, UT 84108-1280

GEOHERMAL ASSESSMENT OF WASHINGTON COUNTY, UTAH

Principal Investigators:

Raymond L. Kerns, Jr.  
Chief Geologist  
SSN 161-32-1373  
801-581-6831

Staff Geologist  
SSN  
801-581-6831

Proposed Starting Date:

01 October 1985

Proposed Duration:

12 months


Amount Requested:

\$40,000.00

Authorized Negotiator:

Archie D. Smith

Legally Authorized Contract Signature:

 5/15/85  
Genevieve Atwood

RECEIVED

MAY 20 1985

ADVANCED TECHNOLOGY  
BRANCH

## ABSTRACT

The purpose of this program is to assess the low-temperature geothermal potential of the Santa Clara Valley and Virgin River Valley in Washington County, Utah. Further, to acquire all available data through the methods of literature search, requests from private industry and a survey of government sources.

## STATEMENT OF WORK

In the Santa Clara and Virgin River Valleys and surrounding terrain of Washington County, Utah, Utah Geological and Mineral Survey will accomplish the following tasks:

1. Conduct a literature search to compile data on the geologic, geochemical, geophysical, and hydrologic environments of Washington County. Include in this compilation records from available water and petroleum wells.
2. Contact appropriate federal agencies (e.g. USGS, USBLM, USFS, etc.) local government entities, state agencies, and private industry sources to obtain published and unpublished data pertinent to the exploration for geothermal resources.
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4. Conduct a field program of well and spring temperature measurements, obtain thermal gradients in appropriate available wells, and sample for and carry out (as funds permit) geochemical analyses of all thermal waters identified and selected non-thermal waters. If appropriate, and time and funding permit, field work could also include geological mapping, new geophysical data gathering, and further hydrologic investigations.
5. Integrate new data with the compiled data and refine the model of geothermal resources developed in No. 3. Develop an assessment of geothermal resource potential in the study area.
6. Prepare and publish a report which will include the new and compiled data, the resource model, and the resource assessment.
7. Provide overall project management and complete and report on tasks in a timely manner. Management reports shall be provided as defined by the attached DOE Form EIA 459A - Reporting Requirements Checklist. The original Final Report for this grant will be due on the original due date. The management and technical reports will be delivered to DOE.

## METHODOLOGY

A survey will be conducted for geothermal data to include a literature search and drill-hole data search. All available data from reliable and documentable sources will be compiled, plotted, and a strategic sampling plan formulated. A selective sampling plan will be initiated and temperature analysis will be conducted and available drill holes probed for temperature-depth relationships. Samples will be commercially tested. Organization for accomplishing the methodology follows.

### Project Manager

1. Overall responsibility for the management and smooth functioning of the program.
2. Responsible for geotechnical decisions.
3. Monitor progress, data acquisition, and costs.

### Principal Investigator

1. Direct supervision of program personnel.
2. Liaison with involved federal, state, and private parties.
3. Responsible for accumulation of project costs.
4. Prepare budget and program reports.
5. Determine or review the geographic and geologic parameters of each sample site in relationship to the project.
6. Plan and implement the objectives in the Statement of Work.
7. Supervise staff geologist and maintain quality control of data and data entries.

### Staff Geologist

1. Initiate and accomplish the objectives in the Statement of Work.
2. Supervise geotechnicians and maintain quality control of data and data entries.
3. Accomplish literature research, conduct field work, and compile data.
4. Author a publishable report with supporting data and graphics.

### Geotechnician

1. Compile data and conduct literature search as directed.
2. Field work as required.
3. Draft, edit, and record data.

### Personnel

The following personnel will work on the program:

Project Manager: Archie D. Smith  
Principal Investigator: Ray Kerns/Staff Geologist  
Geotechnicians I and II: Usually temporary personnel

A resume for each person is attached.

## WORK SCHEDULE

Phase I Literature search and compilation.

Phase II Strategic sampling plan.

Phase III Data acquisition.

Phase IV Data evaluation

Phase V Map and report preparation

#### WORK PLAN COMPLETION SCHEDULE

PHASE	OCT.	JAN.	MAY	SEP.
I	I-----I			
II		I-----I		
III		I-----I		
IV			I-----I	
V				I--I

#### DELIVERABLES

The following information will be provided DOE for each field where data exist and are available.

- a. A compilation and report of geothermal potential.
- b. A location map and others depending on the availability and density of data.

#### SPECIAL EQUIPMENT

UGMS has limited geothermal equipment. However, UGMS intends to increase its capability to generate geothermal data and its ability to efficiently produce accurate verifiable geothermal data. Increased capability is of value and directly beneficial to DOE and other contracts. Therefore, UGMS proposes to capitalize equipment as part of the state share to increase the efficiency of its present capability and to acquire new capability in the generation of data.

## BUDGET ANALYSIS

(01 October 1985 to 30 September 1986)

### A. Salaries

Project Manager Level V

123 hours

Principal Investigator Level IV

140 hours

Staff Geologist Level II

1,044 hours

Geotechnician I

1125 hours

For grade and step monetary amounts see attached Classified Pay Plan. Cost of living raises have been included for succeeding years at 4.5 percent.

### B. Payroll Fringe Benefits

Project Manager 25.57% (actual)

Principal Investigator 26.48% (actual)

Staff Geologist 23.84%

Geotechnician III 6.6% (actual)

### C. Equipment to be Acquired

State share.

### D. Supplies

No quotes obtained - general supplies

### E. Travel

1. Mileage - \$16.08/day or \$0.26/mile whichever is greater.

2. Per diem - state rate (as of July 1, 1984): meals - breakfast, \$5.00; lunch - \$6.00; dinner - \$12.00. Lodging is \$25/night in a motel or \$10/night camping.

### F. Indirect Cost Rate

30.6% of salaries and benefits calculated in 1984 by the UGMS. This figure will be submitted to the U.S. Department of the Interior, Regional Audit Supervisor; Office of the Inspector General, Western Region; Federal Building, Room W-2400; 2800 Cottage Way, Sacramento, California, 95825, for negotiation.

PROPOSAL BUDGET

For the year beginning October 1, 1985 and ending September 30, 1986

<u>Budget Category</u>	<u>DOE Funded</u>	<u>UGMS Funded</u>	<u>Total DOE/UGMS</u>
A. Total labor costs including benefits			
1. Project Manager (Archie D. Smith)	\$ -0-	\$ 2,500.00	\$ 2,500.00
2. Principal Investigator (Ray Kerns)	-0-	2,500.00	2,500.00
3. Staff Geologist	16,019.00	-0-	16,019.00
4. Geotechnician I	6,379.00	-0-	6,379.00
SUBTOTAL	\$22,398.00	\$ 5,000.00	\$27,398.00
B. Equipment to be acquired	-0-	\$ 5,000.00	\$ 5,000.00
C. Supplies	\$ 550.00	-0-	\$ 550.00
D. Testing	\$ 3,840.00	-0-	\$ 3,840.00
E. Travel			
Mileage	\$ 1,980.00	-0-	\$ 1,980.00
Per diem	4,378.00	-0-	4,378.00
Subtotal	\$ 6,358.00	-0-	\$ 6,358.00
TOTAL DIRECT COSTS (A through D)	\$33,146.00	\$10,000.00	\$43,146.00
F. Indirect Cost Rate (30.6%-1985 rate)	\$ 6,854.00	-0-	\$ 6,854.00
TOTAL COST	\$40,000.00	\$10,000.00	\$50,000.00
Share Percentage	80%	20%	100%

## RESUME

NAME: ARCHIE D. SMITH  
TITLE: Senior Geologist, Economic Program

### EDUCATION:

1957 B.S. Geology, Mathematics, Brigham Young University  
1983 MPA Public Administration, Brigham Young University

### EMPLOYMENT HISTORY:

1983-Present Senior Geologist, Utah Geological and Mineral Survey  
1981-1983 Chief Geologist, Utah Geological and Mineral Survey  
1977-1981 Staff Geologist, Utah Geological and Mineral Survey  
1976-1977 Certification Secondary Education, Brigham Young University  
1975 Well Site Geologist, Mudlogger, Tooke Engineering  
1959-1975 Surface Warfare Officer, U.S. Navy  
1958-1959 Geophysical Computer, Shell Oil Company  
1957 Geological Sampler/Drillers Helper, Anaconda Copper  
Company, E.J. Longyear

### MEMBERSHIPS:

Society of Mining Engineers of the American Institute of Mining Metallurgical,  
and Petroleum Engineers  
American Association of Petroleum Geologists  
Utah Geological Association  
The Society for Organic Petrology  
American Society for Public Administration

### PUBLICATIONS:

Authored two Special Studies and an Open File Report  
Co-authored two Special Studies

### EXPERIENCE:

As Senior Geologist for the Economic Program, Utah Geological and Mineral Survey, Mr. Smith is responsible for a major state-wide geological program involving public and industrial contacts at top administrative levels. The program compiles, interprets, maintains, publishes, and disseminates information on the energy and mineral resources of the state of Utah.

Mr. Smith's professional emphasis has been in coal exploration and mine geology. He is knowledgeable in exploration management, coal bed methane determination, coal petrography, and exploratory drilling. As a principal investigator, his coal work includes successful completion of a \$1.5 million drilling and resource evaluation program. Also, collection of numerous coal cores for methane desorption, chemical analysis, and selected petrographic evaluation. He has originated proposals for coal work including authoring operations and work statements; estimating costs and preparing budgets; conducting pre-award surveys; and negotiating contracts and subcontracts.

Mr. Smith has 16 years administrative and management experience as a U.S. Naval Officer including command experience. His naval work involved sustained periods of concentrated and analytical thinking and mental application to resolve complex technical problems and to develop formal written plans. Also, his work involved contacts at all levels affecting fundamental relationships with other services and foreign government officials and personnel. He holds several personal awards and top secret security clearance.



PUBLICATIONS

Smith, A.D., 1981a, Coal drilling, North Horn Mountain, East Mountain areas, Wasatch Plateau, Utah, in Utah Coal Studies II: Utah Geol. Miner. Surv. Spec. Studies, No. 54, p. 1-31.

\_\_\_\_\_, 1981b, Methane content of Utah coals - progress report 1979-1980: Utah Geol. Miner. Surv. Open-File Report 28, 8 p.

\_\_\_\_\_, 1981c, Muddy Creek coal drilling project, Wasatch Plateau: Utah Geol. Miner. Surv. Spec. Studies 55, 57 p.

Foster, D.A. and Smith, A.D., 1983, Bibliography of Utah geology: Utah Geol. Miner. Surv. Bull. 120, in press.

RESUME

NAME: RAYMOND L. KERNS, JR.  
TITLE: Section Chief, Energy Section

EDUCATION:

1959 B.S. Geology, Waynesburg College  
1962 M.A. Geology, Southern Illinois University  
1966 Ph.D. Geology, University of Oklahoma

EMPLOYMENT HISTORY:

1983-Present Section Chief, Utah Geological and Mineral Survey  
1981-1982 District Geologist, Buckhorn Petroleum Company  
1980-1981 Senior Geologist, Council of Energy Resource Tribes  
1979-1980 Advanced Research Geoscientist, Bendix Field Engineering Corporation  
1979-1979 Consulting Geologist, Runge and Associates  
1977-1978 District Geologist, Energy Reserves Group, Inc.  
1974-1977 Senior Exploration Geologist, Phillips Petroleum Company  
1967-1974 Assistant Professor, Utah State University Geology Department  
1965-1967 Geochemist, Oklahoma Geological Survey

MEMBERSHIPS:

Geological Society of America  
American Association of Petroleum Geologists  
Utah Geological Association

PUBLICATIONS:

Authored/co-authored thirteen publications on clay mineralogy, sedimentary petrology, and mineralogy.

EXPERIENCE:

As Energy Section Chief, through the direction of the State Geologist and the Senior Geologist of Economic Geology, supervises the activities of the Survey with respect to Utah resources of oil, gas, oil shale, tar sands, coal, uranium, and geothermal resources.

The Energy Section conducts studies and collects and disseminates information on energy resources in the state for use by the State Geologist, the Governor, the legislature, other state and federal agencies, private industry, and the general public.

It is the Section Chief's responsibility to assure that the section responds in a timely manner to requests for information from the population that it serves. It is also a continuing responsibility of the chief to follow the activities of the industry and its economics so as to be aware of any developments which might affect Utah's revenue position.

Mr. Kerns has a varied background in teaching, private industry, and government service. His areas of expertise include sedimentary petrology, clay mineralogy and geochemistry. He has taught at the college level (7 years), worked for a state geological survey (2 years), and worked in industry (8 years) as a uranium exploration geologist (4 years) and a petroleum geologist (4 years). Geographic areas of professional activity include midcontinent (Oklahoma and Kansas), all of the Rocky Mountain states, and the western states of Washington, Oregon, Nevada and Arizona.

## PUBLICATIONS

- Mankin, C.J., Bellis, W.H., and Kerns, R.L., Jr., 1963, Regional clay petrology of Permian shale in southwestern Oklahoma: Abstract, Proceedings of the Eighth Biennial Geological Symposium, Western Oklahoma and Adjacent Texas, p. 173.
- Kerns, R.L., Jr., 1967, Pickeringite in Oklahoma: Oklahoma Geology Notes, v. 27, no. 6, p. 112-120.
- \_\_\_\_\_, 1967, Clay mineral dehydration: Oklahoma Geology Notes, v. 27, no. 8, p. 155-164.
- \_\_\_\_\_, 1967, Particle-size separation of clays: Oklahoma Geology Notes, v. 27, no. 9, p. 167-174.
- \_\_\_\_\_, 1967, Determination of cation exchange capacity by continuous titration: Oklahoma Geology Notes, v. 27, no. 10, p. 184-192.
- \_\_\_\_\_, 1967, Chemical analyses by x-ray fluorescence: Oklahoma Geology Notes, v. 27, no. 11, 201-210.
- Kerns, R.L., Jr., and Mankin, C.J., 1967, Compositional variation of vermiculite as related to particle size: Clays and Clay Minerals, Proceedings of the 15th Conference, p. 163-179.
- \_\_\_\_\_, 1968, Structural charge-site influence on the interlayer hydration of three-sheet clay minerals: Clays and Clay Minerals, v. 16, no. 1, p. 73-82.
- Fuller, R.H., and Kerns, R.L., Jr., 1971, Study of the effect of pollution in the Bear Lake exosystem: Proceedings of the Utah Academy of Sciences, Arts, and Letters, v. 48, part 2, p. 58 (abstract).
- Davidson, D.F., Fuller, R.H., and Kerns, R.L., Jr., 1971, Some aspects of the geochemistry and mineralogy of Bear Lake sediments, Utah and Idaho: Utah Academy of Sciences, Arts, and Letters, v. 48, part 2, p. 57 (abstract).
- Bilbey, S.A., Kerns, R.L., Jr., and Bowman, J.T., 1974, Petrology of the Morrison Formation, Dinosaur Quarry Quadrangle, Utah: Utah Geol. Miner. Surv. Spec. Studies 48, 16 p.

TECHNICAL EVALUATION  
OF GRANT PROPOSAL

TITLE: Geothermal Assessment of Washington County, Utah

SUBMITTED TO: DOE-ID

SUBMITTED BY: Utah Geological and Mineral Survey  
606 Blackhawk Way  
Salt Lake City, UT 84108

AMOUNT REQUESTED: \$40,000

AMOUNT SUGGESTED: \$40,000

PROPOSED DURATION: 1 July 85 - 30 Sept. 86

PROJECT DESCRIPTION: Assess geothermal resources in the Washington County (St. George) area of Utah. Compile existing geological, geochemical, and geophysical data; supplement these data with new thermal gradient measurements and chemical analyses of all thermal and selected non-thermal springs and wells. Prepare a technical report integrating all the data and interpretations into a model of hydrothermal systems in Washington County.

GENERAL REMARKS:

1. Work Statement: Adequate as rewritten.
2. Task Changes: None required.
3. Cost Information: Revised budget appears reasonable.

SPECIFIC REMARKS:

1. Manhours: Adequate to perform the tasks, but there may be an overemphasis on low-level (technician) efforts, when compared with professional efforts. UGMS is providing supervisory personnel.
2. Materials: UGMS will provide \$5000 as a cost share.
3. Subcontracts: None
4. Travel and Per Deim: Adequate to accomplish the field work.
5. Other Direct Costs: Costs for analyses appear reasonable.

6. Proposer's Capability to Meet the Objectives: UGMS has been active in the State Coupled Program since 1978 and has turned out many reports. This effort is well within their ability.
7. Key Personnel Qualifications: Supervisory personnel indicated have adequate geothermal experience. The key person is qualified to accomplish all work required herein.
8. Anticipated Objectives and Probability of Success: The assessment of geothermal resources should be 100% successful.

## STATEMENT OF WORK

### UTAH GEOLOGICAL AND MINERAL SURVEY

In the Santa Clara and Virgin River Valleys and surrounding terrain of Washington County, Utah, accomplish the following tasks:

- Task 1. Conduct a literature search to compile data on the geologic, geochemical, geophysical, and hydrologic environments of Washington County. Include in this compilation records from available water and petroleum wells.
- Task 2. Contact appropriate federal agencies (e.g. USGS, USBLM, USFS, etc.), local government entities, state agencies, and private industry sources to obtain published and unpublished data pertinent to the exploration for geothermal resources.
- Task 3. Integrate and interpret the existing data base compiled in Tasks 1 and 2 and develop a conceptual model for geothermal resources. Identify gaps in the data base, and develop a field program to provide data required to refine the model and verify data.
- Task 4. Conduct a field program of well and spring temperature measurements, obtain thermal gradients in appropriate available wells, and sample for and carry out (as funds permit) geochemical analyses of all thermal waters identified and selected non-thermal waters. If appropriate, and time and funding permit, field work could also include geological mapping, new geophysical data gathering, and further hydrologic investigations.
- Task 5. Integrate new data with the compiled data and refine the model of geothermal resources developed in task 3. Develop an assessment of geothermal resource potential in the study area.
- Task 6. Prepare and publish a report which will include the new and compiled data, the resource model, and the resource assessment.
- Task 7. Provide overall project management and complete and report on tasks in a timely manner. Management reports shall be provided as defined by the attached DOE Form EIA 459A - Reporting Requirements Checklist. The original Final Report for this grant will be due on the original due date. The required reports are also summarized as follows:

	<u>REPORT</u>	<u>DUE</u>
(1)	Form DOE 538 Notice of Energy RD&D	30 days after award of grant
(2)	Quarterly Management Summary Report	15 days after calendar quarter end
(3)	Project Status Report	15 days after calendar quarter end
(4)	Phase I Final Report (Draft)	Due 45 days prior to original completion date
(5)	Phase I Final Report	Due on original completion date
(6)	Final Report (Draft)	Due 45 days prior to updated completion date
(7)	Final Report	Due on updated completion date
(8)	Financial Status Report - OMB Form 269	Due annually and upon completion

The deliverables resulting from the tasks outlined above which will be delivered to DOE are summarized as follows:

1. The original Final Report (herein referred to as Phase I Final Report) and the Final Report for this addition to the grant--one camera-ready copy plus sixteen additional copies--will be distributed as specified in the attached DOE Form EIA 459A.
2. Reports previously described under Task 8 above will be prepared and issued in the amounts and at the frequency shown.





**U.S. DEPARTMENT OF ENERGY  
IDAHO OPERATIONS OFFICE  
REPORT DISTRIBUTION LIST**

Federal Assistance Measure Plan  
 Federal Assistance Budget Informator Form  
 Federal Assistance Management Summary Report  
 Federal Status Report, OMB Form 209  
 Notice of Energy RDO  
 Technical Progress Report  
 Topical Report  
 Final Technical Report

Addressees	Number of Report Copies																				
U. S. Department of Energy Idaho Operations Office 550 Second Street Idaho Falls, ID 83401 Attn: Peggy Brookshier, Prog. Mgr. Energy & Technology Division Attn: Elizabeth M. Hyster Contracts Management Div. Attn: E. G. Jones, Director Financial Management Div.	2	2								8	8*										
U. S. Department of Energy Forrestal Bldg., CE-324 1000 Independence Ave, S.W. Washington, DC 20585 Attn: Marshall Reed	1	1								2	2										
University of Utah Research Institute Earth Science Laboratory 391 Chipeta Way, Suite A Salt Lake City, UT 84108 Attn: Duncan Foley	1	1										1	1								
U. S. Department of Energy Technical Information Center P. O. Box 62 Oak Ridge, TN 37830																					1

**Special Instructions**

\* Government ready must be included.

**U.S. DEPARTMENT OF ENERGY  
FEDERAL ASSISTANCE REPORTING CHECKLIST**

FORM EIA 463A  
110-90

FORM APPROVED  
OMB NO 1900-0127

<b>1. Identification Number:</b> DE-FG07	<b>2. Program/Project Title:</b> Geothermal Research Grant		
<b>3. Recipient:</b> Utah Geological and Mineral Survey			
<b>4. Reporting Requirements:</b>  PROGRAM/PROJECT MANAGEMENT REPORTING <input type="checkbox"/> Federal Assistance Milestone Plan <input type="checkbox"/> Federal Assistance Budget Information Form <input checked="" type="checkbox"/> Federal Assistance Management Summary Report <input checked="" type="checkbox"/> Federal Assistance Program/Project Status Report <input checked="" type="checkbox"/> Financial Status Report, OMB Form 269  TECHNICAL INFORMATION REPORTING <input checked="" type="checkbox"/> Notice of Energy RD&D <input type="checkbox"/> Technical Progress Report <input checked="" type="checkbox"/> Topical Report <input checked="" type="checkbox"/> Final Technical Report	<b>Frequency</b>	<b>No. of Copies</b>	<b>Addressees</b>
	Q  Q  Y, F   Y   A*  F*		
<b>FREQUENCY CODES AND DUE DATES:</b>  A - As Necessary; within 5 calendar days after events. F - Final; Upon completion date Q - Quarterly; within 5 days after end of calendar quarter or portion thereof. O - One time after project starts; within 30 days after award. X - Required with proposals or with the application or with significant planning changes. Y - Yearly; 30 days after the end of program year. (Financial Status Reports 90 days). S - Semiannually; within 30 days after end of program fiscal half year.			
<b>5. Special Instructions:</b>  *Draft is due 45 days prior to completion date for review and comment.			
<b>6. Prepared by: (Signature and Date)</b>	<b>7. Reviewed by: (Signature and Date)</b>		

U.S. Department of Energy  
Procurement Request-Authorization

1. To Awarding Office <u>Contracts Management Division</u>		3. PR Number <u>—</u>
2. From Initiating Office <u>Advanced Technology Division</u>		4. Change/Correction to a PR in Process? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		5. If Item 4 is yes, enter PR correction Letter _____
		6. <input type="checkbox"/> Procurement <input checked="" type="checkbox"/> Assistance
		7. Consistent with Principal Purpose of Program? <input type="checkbox"/> Yes <input type="checkbox"/> No

8. Action Description/Title (180 char. max.) Geothermal Research Grant - Utah Geological and Mineral Survey modify existing grant.

If award is competitive, has list of sources been attached?  Yes  No If Non-Competitive, Complete Items 9-11.

9. Name Utah Geological and Mineral Survey 11. Address 606 Blackhawk Way Salt Lake City, UT 84108

10. Division \_\_\_\_\_ 12. For Procurement Actions Only: Product or Service Code \_\_\_\_\_

13. For Assistance Actions Only: CFDA Number \_\_\_\_\_ 14. Cooperative Agreement  15. Grant

16. Controlled Deliverable For All Actions \_\_\_\_\_ 17. Kind of Award Action (Recommended) IP 18. Master Bin \_\_\_\_\_ 19. Desired Award Date Mo Day Year \_\_\_\_\_

20. Unsolicited Proposal Number \_\_\_\_\_ 21. Project Number 12543

22. Government Property \_\_\_\_\_ F-Furnished, P-Purchased, N-Not involved

FINANCIAL DATA

23. Government Share 40,000 24. Awardee Share \_\_\_\_\_ 25. Total \_\_\_\_\_

FY FUNDS COMMITTED

26. Approp. Symbol	27. B&R Number	28. Dollar Amt.	29. Allotment	30. Object Class	31. AFP	32. CFA

33. From Continuation Sheet \_\_\_\_\_ 35. Project Period from \_\_\_\_\_ thru 9/30/86

Total Funds this PR 40000 36. Budget Period from \_\_\_\_\_ thru 9/30/86

PROJECT MANAGER/INITIATOR

37. Name Peggy A.M. Brookshire 38. Signature [Signature] 39. Date 5/21/85 40. Office Code \_\_\_\_\_

R. Eldon Bray 41. FTS Telephone Number 383-1403

PROGRAM REVIEWING OFFICIAL

42. Name Charles E. Gilmore 43. Signature [Signature] 44. Date 5-21-85

PROGRAM OFFICE BUDGET OFFICIAL

45. Name Dennis R. Bell 46. Signature \_\_\_\_\_

CERTIFYING OFFICIAL. I hereby certify that the funds cited in item 34 are available

47. Name Frank S. Smith 48. Signature \_\_\_\_\_ 49. Date \_\_\_\_\_

**U.S. DEPARTMENT OF ENERGY**

DOE.F 4220.2 (6-80) (Formerly PR-415)		<b>SMALL BUSINESS/LABOR SURPLUS SET-ASIDE REVIEW</b>		I.D. NO. _____	
ITEM TITLE/DESCRIPTION <i>Geothermal Research Grant Utah Geological and Mineral Survey</i>			SMALL BUSINESS SIZE STANDARD RECOMMENDED BY S.B. SPECIALIST EMPLOYEES NUMBER _____ DOLLAR \$ _____ SIC CODE: _____		
PROGRAM OFFICE: _____		PROCURING ACTIVITY: _____			
SB/LS PARTICIPATION WAS CONSIDERED IN THE PREPARATION OF THIS PROCUREMENT ITEM AND FOLLOWING IS RECOMMENDED: <input type="checkbox"/> Small Business Set-Aside _____% \$ _____ <input type="checkbox"/> Labor Surplus Set-Aside _____% \$ _____ <input type="checkbox"/> SBA Section 8(a) Procurement <input checked="" type="checkbox"/> Set-Aside Action Not Recommended			NAME AND LOCATION OF PROPOSED SOURCE: (If Sole Source)  <input type="checkbox"/> Small Business <input type="checkbox"/> Minority <input type="checkbox"/> Labor Surplus Firm <input type="checkbox"/> Other		
SET-ASIDE NOT FEASIBLE BECAUSE: <input type="checkbox"/> No Reasonable Expectation of Receiving Sufficient Offers from SB/LS Firms to Assure Award* <input type="checkbox"/> Program Objectives Dictate Broadest Possible Solicitation to Obtain "Best Available" Expertise* <input type="checkbox"/> Solicitation if for "Best Idea/Approach" R&D Effort <input type="checkbox"/> Continuing and Directly Related R&D Effort. Competitive Procurement Not Feasible for Economic and/or Technical Reasons <input type="checkbox"/> Procurement is for Completion or Within-Scope Expansion of Current Contract <input type="checkbox"/> This is for Extension of Current Services to Allow Preparation/Award of Competitive Follow on Procurement <input type="checkbox"/> Sole Source as Determined Under Current DOE Policy Directives <input type="checkbox"/> Funding of Unsolicited Proposal Under Current DOE Policy Directives <input checked="" type="checkbox"/> Other* *Explanation Required		EXPLANATION/ADDITIONAL COMMENT: <i>State Teams Geothermal activity to promote technology utilization within participating states. A justification for Restricted Eligibility has been approved.</i>			
		SMALL BUSINESS SPECIALIST CONSULTED (Check One) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
				TELEPHONE _____	
				P.R. REQUESTOR _____ DATE _____	
SMALL BUSINESS SPECIALIST'S ENDORSEMENT <input type="checkbox"/> Accepts <input type="checkbox"/> Requests Reevaluation <input type="checkbox"/> Request Solicitation of SB/LS Sources Attached <input type="checkbox"/> Request Special SB/LS/MB Incentive Provisions (Attached) <input type="checkbox"/> Other Comments/Attached					
REEVALUATION OF RECOMMENDATIONS/FINDINGS <input type="checkbox"/> Reaffirmed <input type="checkbox"/> Set-Aside Feasible		REVIEWED BY SBA <input type="checkbox"/> Request Solicitation of SB Sources Attached SBA Form 70 Attached <input type="checkbox"/> Yes <input type="checkbox"/> No			
AUTHORIZING PROGRAM OFFICIAL _____ DATE _____		SMALL BUSINESS SPECIALIST _____ DATE _____		SBA REPRESENTATIVE _____ DATE _____	
PROCUREMENT OFFICER'S ACTION <input type="checkbox"/> SB/LB Set-Aside <input type="checkbox"/> Set-Aside Not Initiated <input type="checkbox"/> Other Recommendations/Request Noted and Appropriate Action Taken			CONTRACT NO.(S) _____ SB/MB/OTHER _____		
PROCUREMENT OFFICER _____ DATE _____					

## DETERMINATION OF RESTRICTED ELIGIBILITY

(Modification of Attached FY-84 Justification for Non-Competitive Awards)

I recommend that negotiations be conducted only with those organizations listed below for the services described herein in accordance with DOE Assistance Regulations Subpart 600.38 (b). Also, approximately five grants made to similar agencies in FY-84 will be amended and additional funds provided.

### Organization

University of North Dakota, Geology Dept.

State of South Dakota, Energy Office

University of Wyoming, Dept. of Geology & Geophysics

### 1. Assistance to be Furnished

- A. DOE will be providing financial assistance to the above named universities and state government agencies for geothermal resource assessment and to promote geothermal technology transfer within the participating states. Emphasis will be placed on detailed studies within areas with high temperature resources and/or expansion of work previously conducted within the states.
- B. The work to be provided by each university or state agency will be tailored to the needs within each state and DOE objectives for continued resource assessment and technology transfer.

### 2. Background

- A. The State Teams Programs were initiated approximately seven years ago. At the program peak DOE-ID was administering 39 geothermal contracts, cooperative agreements, or grants with universities and state agencies. Eight of the above mentioned organizations are at present in the final phases of their agreements with DOE; the remainder have completed the work, and their agreements were closed out. Ten new grants or contract additions were implemented in FY-84.
- B. This work is a continuation of the previous program in the sense that it is for geothermal resource assessment and technology transfer. However, the new emphasis will be in accordance with the generic guidelines set forth in "C" below and will generally investigate higher temperature systems.
- C. All work will be within the generic guidelines of DOE which are to implement these activities within states which:
  1. Have potential for high temperature geothermal resources
  2. Whose resource assessment efforts will support R&D investigations required by magma and Cascades research programs

3. Have existing resource and energy groups actively supporting geothermal development
4. Are currently providing outstanding technology transfer and institutional problem mitigation activities

D. It is not anticipated that DOE will be able to develop competition for this work. The performing state agencies and universities were designated by the Governor's Office of each participating state. An attempt to stimulate competition would be contrary to DOE's policy of cooperation with state governments.

### 3. Estimated Cost

- A. The program funding level of \$1,000,000 was designated by the FY-85 Appropriations Bill and DOE-HQ. The funding levels for the individual states range from \$20,000 to \$150,000 and were established by ID and HQ based on the prior state teams annual funding levels, the amount and quality of work previously accomplished at these levels, and the amount of productive work remaining to be done.
- B. The FY-85 funding level for the portion of the program to be administered at DOE-ID is \$620,000 of the total program funding of \$1,000,000. This level of funding is lower than any of the previous seven years; the amount to be funded in future years is uncertain.
- C. It is the intent of this program to expand the knowledge of higher temperature resources within individual states. This work was performed in previous years by the organizations within each state which were designated by the respective Governor's Office. Any change in contractors at this time would increase costs and delay the program and could only be undertaken with the consent of the Governor's Office in each state.

### 4. Schedule Requirements

- A. The basis for the rapid emplacement of the subject program is the need by the agencies to commit funds several months in advance of the summer field season. Delay in emplacement of the grants could cause a 1-year postponement of field activities.
- B. It is also important to get the work started as soon as possible because the existing expertise may be disbanded if the work presently contracted for is completed prior to the emplacement of this subject program. The existing expertise has been developed to a great extent under the previous DOE-ID assistance and a lapse in DOE funding could result in lack of financial support for the

organizations. This cadre of experienced expertise is critical for high quality resource assessment and technology transfer, and it is doubtful that any other organizations can perform as well in the respective states as those which are listed above. Rapid emplacement of this program will help ensure the retention of the existing expertise.

C. It is doubtful that any savings can be realized or that competition can be increased by relaxing schedules.

5. Exclusive Capacity & Capability

It was determined at the beginning of the previous program to use universities and state agencies to perform the work because these organizations had already performed research in the particular areas, had basic staffs and departments capable of performing the research and were designated by the state executives. The experience of these organizations has been further enhanced by the work they have conducted for DOE during the past seven years.

In light of these facts, I consider the proposed sources as the only acceptable ones for the planned assistance and recommend authorization of negotiations without further competition.

RECOMMENDED:

R. E. Wood  
R. E. Wood, Assistant Manager  
Projects and Energy Programs

1/25/85  
Date

CONCUR:

George C. Wingerson  
George C. Wingerson  
Office of the Chief Counsel

1/25/85  
Date

J. F. Marmo  
J. F. Marmo, Director  
Contracts Management Division

2/11/85  
Date

APPROVED:

Troy E. Wade II  
Troy E. Wade II, Manager  
Idaho Operations Office

2-5  
Date

## JUSTIFICATION FOR NON-COMPETITIVE AWARDS

I recommend that negotiations be conducted only with those organizations listed below for the services described herein in accordance with DOE-PR 9-3.805-501.

### Organization

State of Washington, Department of Natural Resources  
State of Washington, Energy Office  
State of Oregon, Dept. of Geology & Mineral Industries  
State of Oregon, Department of Energy  
State of Alaska, Department of Commerce & Economic Development, Office of Energy  
University of Alaska, Geophysical Institute  
State of Alaska, Department of Natural Resources  
New Mexico State University, Energy Institute  
State of New Mexico Energy & Minerals Department  
Idaho Department of Water Resources  
State of Utah, Utah Geological & Mineral Survey  
State of Utah, Division of Water Rights  
State of Montana, Dept. of Natural Resources & Conservation  
State of Montana, College of Mineral Science & Technology



1. Description of Supplies or Services to be Supported

- A. The actions with the above named universities and state government agencies are for geothermal resource assessment and to promote geothermal technology transfer within the participating states. Emphasis will be placed on detailed studies within areas with high temperature resources and/or expansion of work previously conducted within the states.
- B. The work to be provided by each university or state agency will be tailored to the needs within each state and DOE objectives for continued resource assessment and technology transfer.

2. History, Estimated Future Requirements, and Long-Range Objectives

- A. The State Teams Programs were initiated approximately seven years ago. At the program peak DOE-ID was administering 39 geothermal contracts, cooperative agreements, or grants with universities and state agencies. Eight of the above mentioned organizations are at present in the final phases of their agreements with DOE; the remainder have completed the work, and their agreements were closed out.
- B. This work is a continuation of the previous program in the sense that it is for geothermal resource assessment and technology transfer. However, the new emphasis will be in accordance with the generic guidelines set forth in C below and will investigate higher temperature systems.
- C. All work will be within the generic guidelines of DOE which are to implement these activities within states which:
  - 1. Have potential for high temperature geothermal resources
  - 2. Whose resource assessment efforts will support R&D investigations required by magma and Cascades research programs
  - 3. Have existing resource and energy groups actively supporting geothermal development
  - 4. Are currently providing outstanding technology transfer and institutional problem mitigation activities
- D. It is not anticipated that DOE will be able to develop competition for this work. The performing state agencies and universities were designated by the Governor's Office of each participating state. An attempt to stimulate competition would be contrary to DOE's policy of cooperation with state governments.

### 3. Estimated Cost

- A. The program funding level of \$1,925,000 was designated by the FY-84 Appropriations Bill and DOE-HQ. The funding levels for the individual states range from \$ 90,000 to \$145,000 and were established by ID and HQ based on the prior state teams annual funding levels, the amount and quality of work previously accomplished at these levels, and the amount of productive work remaining to be done.
- B. The FY-84 funding level for the portion of the program to be administered at DOE-ID is \$1,295,000 of the total program funding of \$1,925,000. This level of funding is lower than any of the previous seven years; the amount to be funded in future years is uncertain.
- C. It is the intent of this program to expand the knowledge of higher temperature resources within individual states. This work was performed in previous years by the organizations within each state which were designated by the respective Governor's Office. Any change in contractors at this time would increase costs and delay the program and could only be undertaken with the consent of the Governor's Office in each state.

### 4. Schedule Requirements

- A. The basis for the rapid emplacement of the subject program is the imminent close-out of the agreements DOE now has with several of the organizations we wish to have perform under the FY-84 program. The agreements presently in place are scheduled for various completion dates ranging from almost immediately to September 1984.
- B. It is important to get the work started as soon as possible because the existing expertise may be disbanded if the work presently contracted for is completed prior to the emplacement of this subject program. The existing expertise has been developed to a great extent under the previous DOE-ID contracts and a lapse in DOE funding could result in lack of financial support for the organizations. This cadre of experienced expertise is critical for high quality resource assessment and technology transfer, and it is doubtful that any other organizations can perform as well in the respective states as those which are listed above. Rapid emplacement of this program will help ensure the retention of the existing expertise.
- C. It is doubtful that any savings can be realized or that competition can be increased by relaxing schedules.

5. Exclusive Capacity & Capability

It was determined at the beginning of the previous program to use universities and state agencies to perform the work because these organizations had already performed research in the particular areas, had basic staffs and departments capable of performing the research, and were designated by the state executives. The experience of these organizations has been further enhanced by the work they have conducted for DOE during the past seven years.

RECOMMENDED:

R E Wood

R. E. Wood, Director  
Energy and Technology Division

CONCUR:

George C. Wingerson

George C. Wingerson  
Office of the Chief Counsel

J. F. Marmo 2/5/84

J. F. Marmo, Director  
Contracts Management Division

APPROVED:

Troy E. Wade

Troy E. Wade, Manager  
Idaho Operations Office

2/7/84

Date

**U.S. DEPARTMENT OF ENERGY  
FEDERAL ASSISTANCE REPORTING CHECKLIST**

FORM EIA 450A  
11/80

FORM APPROVED  
OMB NO 1900-0127

<b>1. Identification Number:</b> DE-FG07	<b>2. Program/Project Title: Geothermal</b> <i>Research Project</i>		
<b>3. Recipient:</b> <i>Utah Geological and Mineral Survey</i>			
<b>4. Reporting Requirements:</b>	<b>Frequency</b>	<b>No. of Copies</b>	<b>Addressees</b>
<b>PROGRAM/PROJECT MANAGEMENT REPORTING</b>			
<input type="checkbox"/> Federal Assistance Milestone Plan			
<input type="checkbox"/> Federal Assistance Budget Information Form			
<input checked="" type="checkbox"/> Federal Assistance Management Summary Report	Q		
<input checked="" type="checkbox"/> Federal Assistance Program/Project Status Report	Q		
<input checked="" type="checkbox"/> Financial Status Report, OMB Form 269	Y, F		
<b>TECHNICAL INFORMATION REPORTING</b>			
<input checked="" type="checkbox"/> Notice of Energy RD&D	Y		
<input type="checkbox"/> Technical Progress Report			
<input checked="" type="checkbox"/> Topical Report	A*		
<input checked="" type="checkbox"/> Final Technical Report	F*		
<b>FREQUENCY CODES AND DUE DATES:</b>  A - As Necessary; within 5 calendar days after events. F - Final; Upon completion date Q - Quarterly; within 15 days after end of calendar quarter or portion thereof. O - One time after project starts; within 30 days after award. X - Required with proposals or with the application or with significant planning changes. Y - Yearly; 30 days after the end of program year. (Financial Status Reports 90 days). S - Semiannually; within 30 days after end of program fiscal half year.			
<b>5. Special Instructions:</b>  <i>*Due date is due 45 days prior to completion date for review and comment.</i>			
<b>6. Prepared by: (Signature and Date)</b>	<b>7. Reviewed by: (Signature and Date)</b>		

U.S. Department of Energy  
Procurement Request-Authorization

1. To Awarding Office <u>Contracts Management Division</u>		3. PR Number -	4. Change/Correction to a PR in Process? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. From Initiating Office <u>Advanced Technology Division</u>		5. If Item 4 is yes, enter PR correction Letter	
8. Action Description/Title (180 char. max.) <u>Geothermal Research Grant - Utah Geological and Mineral Survey modify existing grant</u>		6. <input type="checkbox"/> Procurement <input checked="" type="checkbox"/> Assistance	
		7. Consistent with Principal Purpose of Program? <input type="checkbox"/> Yes <input type="checkbox"/> No	

If award is competitive, has list of sources been attached? <input type="checkbox"/> Yes <input type="checkbox"/> No		If Non-Competitive, Complete Items 9-11.	
9. Name <u>Utah Geological and Mineral Survey</u>		11. Address <u>606 Blackhawk Way Salt Lake City, UT 84119</u>	
10. Division			
12. For Procurement Actions Only: Product or Service Code			
13. For Assistance Actions Only: CFDA Number		14. Cooperative Agreement <input type="checkbox"/>	15. Grant <input checked="" type="checkbox"/>
16. Controlled Deliverable For All Actions	17. Kind of Award Action (Recommended) <u>IP</u>	18. Master Bin	19. Desired Award Date Mo Day Year
20. Unsolicited Proposal Number		21. Project Number <u>12543</u>	
22. Government Property <input type="checkbox"/> F-Furnished, P-Purchased, N-Not involved			

FINANCIAL DATA		
23. Government Share <u>40,000</u>	24. Awardee Share	25. Total

FY FUNDS COMMITTED						
26. Approp. Symbol	27. B&R Number	28. Dollar Amt.	29. Allotment	30. Object Class	31. AFP	32. CFA

33. From Continuation Sheet	35. Project Period from _____ thru <u>9/30/85</u>
Total Funds this PR <u>40000</u>	36. Budget Period from _____ thru <u>9/30/85</u>

PROJECT MANAGER/INITIATOR			
37. Name <u>Rory A.M. Brookshire</u>	38. Signature <u>[Signature]</u>	39. Date <u>5/21/85</u>	40. Office Code
<u>R. Eldon Gray</u>			41. FTS Telephone Number <u>383-1403</u>

PROGRAM REVIEWING OFFICIAL		
42. Name <u>Charles E. Gilmore</u>	43. Signature <u>[Signature]</u>	44. Date <u>5-21-85</u>

PROGRAM OFFICE BUDGET OFFICIAL	
45. Name <u>Dennis R. Bell</u>	46. Signature

CERTIFYING OFFICIAL. I hereby certify that the funds cited in item 34 are available		
47. Name <u>Frank S. Smith</u>	48. Signature	49. Date

**U.S. DEPARTMENT OF ENERGY**

DOE F 4220.2 (6-80) (Formerly PR-415)		I.D. NO. _____	
<b>SMALL BUSINESS/LABOR SURPLUS SET-ASIDE REVIEW</b>		SMALL BUSINESS SIZE STANDARD RECOMMENDED BY S.B. SPECIALIST EMPLOYEES NUMBER _____ DOLLAR \$ _____ SIC CODE: _____	
ITEM TITLE/DESCRIPTION <i>Geothermal Research Grant Utah Geological and Mineral Survey</i>		PROGRAM OFFICE: _____	
SB/LS PARTICIPATION WAS CONSIDERED IN THE PREPARATION OF THIS PROCUREMENT ITEM AND FOLLOWING IS RECOMMENDED: <input type="checkbox"/> Small Business Set-Aside _____% \$ _____ <input type="checkbox"/> Labor Surplus Set-Aside _____% \$ _____ <input type="checkbox"/> SBA Section 8(a) Procurement <input checked="" type="checkbox"/> Set-Aside Action Not Recommended		PROCURING ACTIVITY: _____	
NAME AND LOCATION OF PROPOSED SOURCE: (If Sole Source)  <input type="checkbox"/> Small Business <input type="checkbox"/> Minority <input type="checkbox"/> Labor Surplus Firm <input type="checkbox"/> Other		SET-ASIDE NOT FEASIBLE BECAUSE: <input type="checkbox"/> No Reasonable Expectation of Receiving Sufficient Offers from SB/LS Firms to Assure Award* <input type="checkbox"/> Program Objectives Dictate Broadest Possible Solicitation to Obtain "Best Available" Expertise* <input type="checkbox"/> Solicitation if for "Best Idea/Approach" R&D Effort <input type="checkbox"/> Continuing and Directly Related R&D Effort. Competitive Procurement Not Feasible for Economic and/or Technical Reasons <input type="checkbox"/> Procurement is for Completion or Within-Scope Expansion of Current Contract <input type="checkbox"/> This is for Extension of Current Services to Allow Preparation/Award of Competitive Follow on Procurement <input checked="" type="checkbox"/> Sole Source as Determined Under Current DOE Policy Directives <input type="checkbox"/> Funding of Unsolicited Proposal Under Current DOE Policy Directives <input checked="" type="checkbox"/> Other* Explanation Required	
EXPLANATION/ADDITIONAL COMMENT: <i>State Teams Geothermal activity to promote technology utilization within participating states. A justification for Restricted Eligibility has been approved.</i>		SMALL BUSINESS SPECIALIST CONSULTED (Check One) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
SMALL BUSINESS SPECIALIST'S ENDORSEMENT <input type="checkbox"/> Accepts <input type="checkbox"/> Requests Reevaluation <input type="checkbox"/> Request Solicitation of SB/LS Sources Attached <input type="checkbox"/> Request Special SB/LS/MB Incentive Provisions (Attached) <input type="checkbox"/> Other Comments/Attached		TELEPHONE _____  P.R. REQUESTOR _____      DATE _____	
SMALL BUSINESS SPECIALIST _____      DATE _____		REEVALUATION OF RECOMMENDATIONS/FINDINGS <input type="checkbox"/> Reaffirmed <input type="checkbox"/> Set-Aside Feasible  AUTHORIZING PROGRAM OFFICIAL _____      DATE _____	
REVIEWED BY SBA <input type="checkbox"/> Request Solicitation of SB Sources Attached SBA Form 70 Attached <input type="checkbox"/> Yes <input type="checkbox"/> No  SBA REPRESENTATIVE _____      DATE _____		PROCUREMENT OFFICER'S ACTION <input type="checkbox"/> SB/LB Set-Aside <input type="checkbox"/> Set-Aside Not Initiated <input type="checkbox"/> Other Recommendations/Request Noted and Appropriate Action Taken  PROCUREMENT OFFICER _____      DATE _____	
CONTRACT NO.(S) _____		SB/MB/OTHER _____	

**ORIGINAL-CONTRACT FILE (FULLY EXECUTED)**

## DETERMINATION OF RESTRICTED ELIGIBILITY

(Modification of Attached FY-84 Justification for Non-Competitive Awards)

I recommend that negotiations be conducted only with those organizations listed below for the services described herein in accordance with DOE Assistance Regulations Subpart 600.38 (b). Also, approximately five grants made to similar agencies in FY-84 will be amended and additional funds provided.

### Organization

University of North Dakota, Geology Dept.

State of South Dakota, Energy Office

University of Wyoming, Dept. of Geology & Geophysics

### 1. Assistance to be Furnished

- A. DOE will be providing financial assistance to the above named universities and state government agencies for geothermal resource assessment and to promote geothermal technology transfer within the participating states. Emphasis will be placed on detailed studies within areas with high temperature resources and/or expansion of work previously conducted within the states.
- B. The work to be provided by each university or state agency will be tailored to the needs within each state and DOE objectives for continued resource assessment and technology transfer.

### 2. Background

- A. The State Teams Programs were initiated approximately seven years ago. At the program peak DOE-ID was administering 39 geothermal contracts, cooperative agreements, or grants with universities and state agencies. Eight of the above mentioned organizations are at present in the final phases of their agreements with DOE; the remainder have completed the work, and their agreements were closed out. Ten new grants or contract additions were implemented in FY-84.
- B. This work is a continuation of the previous program in the sense that it is for geothermal resource assessment and technology transfer. However, the new emphasis will be in accordance with the generic guidelines set forth in "C" below and will generally investigate higher temperature systems.
- C. All work will be within the generic guidelines of DOE which are to implement these activities within states which:
  1. Have potential for high temperature geothermal resources
  2. Whose resource assessment efforts will support R&D investigations required by magma and Cascades research programs

3. Have existing resource and energy groups actively supporting geothermal development
  4. Are currently providing outstanding technology transfer and institutional problem mitigation activities
- D. It is not anticipated that DOE will be able to develop competition for this work. The performing state agencies and universities were designated by the Governor's Office of each participating state. An attempt to stimulate competition would be contrary to DOE's policy of cooperation with state governments.

3. Estimated Cost

- A. The program funding level of \$1,000,000 was designated by the FY-85 Appropriations Bill and DOE-HQ. The funding levels for the individual states range from \$20,000 to \$150,000 and were established by ID and HQ based on the prior state teams annual funding levels, the amount and quality of work previously accomplished at these levels, and the amount of productive work remaining to be done.
- B. The FY-85 funding level for the portion of the program to be administered at DOE-ID is \$620,000 of the total program funding of \$1,000,000. This level of funding is lower than any of the previous seven years; the amount to be funded in future years is uncertain.
- C. It is the intent of this program to expand the knowledge of higher temperature resources within individual states. This work was performed in previous years by the organizations within each state which were designated by the respective Governor's Office. Any change in contractors at this time would increase costs and delay the program and could only be undertaken with the consent of the Governor's Office in each state.

4. Schedule Requirements

- A. The basis for the rapid emplacement of the subject program is the need by the agencies to commit funds several months in advance of the summer field season. Delay in emplacement of the grants could cause a 1-year postponement of field activities.
- B. It is also important to get the work started as soon as possible because the existing expertise may be disbanded if the work presently contracted for is completed prior to the emplacement of this subject program. The existing expertise has been developed to a great extent under the previous DOE-ID assistance and a lapse in DOE funding could result in lack of financial support for the



organizations. This cadre of experienced expertise is critical for high quality resource assessment and technology transfer, and it is doubtful that any other organizations can perform as well in the respective states as those which are listed above. Rapid emplacement of this program will help ensure the retention of the existing expertise.

C. It is doubtful that any savings can be realized or that competition can be increased by relaxing schedules.

5. Exclusive Capacity & Capability

It was determined at the beginning of the previous program to use universities and state agencies to perform the work because these organizations had already performed research in the particular areas, had basic staffs and departments capable of performing the research and were designated by the state executives. The experience of these organizations has been further enhanced by the work they have conducted for DOE during the past seven years.

In light of these facts, I consider the proposed sources as the only acceptable ones for the planned assistance and recommend authorization of negotiations without further competition.

RECOMMENDED:

R. E. Wood  
R. E. Wood, Assistant Manager  
Projects and Energy Programs

11/25/85  
Date

CONCUR:

George C. Wingerson  
George C. Wingerson  
Office of the Chief Counsel

1/25/85  
Date

J. F. Marmo  
J. F. Marmo, Director  
Contracts Management Division

2/11/85  
Date

APPROVED:

Troy E. Wade II  
Troy E. Wade II, Manager  
Idaho Operations Office

2-11-85  
Date

## JUSTIFICATION FOR NON-COMPETITIVE AWARDS

I recommend that negotiations be conducted only with those organizations listed below for the services described herein in accordance with DOE-PR 9-3.805-501.

### Organization

State of Washington, Department of Natural Resources

State of Washington, Energy Office

State of Oregon, Dept. of Geology & Mineral Industries

State of Oregon, Department of Energy

State of Alaska, Department of Commerce & Economic Development, Office of Energy

University of Alaska, Geophysical Institute

State of Alaska, Department of Natural Resources

New Mexico State University, Energy Institute

State of New Mexico Energy & Minerals Department

Idaho Department of Water Resources

State of Utah, Utah Geological & Mineral Survey

State of Utah, Division of Water Rights

State of Montana, Dept. of Natural Resources & Conservation

State of Montana, College of Mineral Science & Technology

1. Description of Supplies or Services to be Supported

- A. The actions with the above named universities and state government agencies are for geothermal resource assessment and to promote geothermal technology transfer within the participating states. Emphasis will be placed on detailed studies within areas with high temperature resources and/or expansion of work previously conducted within the states.
- B. The work to be provided by each university or state agency will be tailored to the needs within each state and DOE objectives for continued resource assessment and technology transfer.

2. History, Estimated Future Requirements, and Long-Range Objectives

- A. The State Teams Programs were initiated approximately seven years ago. At the program peak DOE-ID was administering 39 geothermal contracts, cooperative agreements, or grants with universities and state agencies. Eight of the above mentioned organizations are at present in the final phases of their agreements with DOE; the remainder have completed the work, and their agreements were closed out.
- B. This work is a continuation of the previous program in the sense that it is for geothermal resource assessment and technology transfer. However, the new emphasis will be in accordance with the generic guidelines set forth in C below and will investigate higher temperature systems.
- C. All work will be within the generic guidelines of DOE which are to implement these activities within states which:
  - 1. Have potential for high temperature geothermal resources
  - 2. Whose resource assessment efforts will support R&D investigations required by magma and Cascades research programs
  - 3. Have existing resource and energy groups actively supporting geothermal development
  - 4. Are currently providing outstanding technology transfer and institutional problem mitigation activities
- D. It is not anticipated that DOE will be able to develop competition for this work. The performing state agencies and universities were designated by the Governor's Office of each participating state. An attempt to stimulate competition would be contrary to DOE's policy of cooperation with state governments.

### 3. Estimated Cost

- A. The program funding level of \$1,925,000 was designated by the FY-84 Appropriations Bill and DOE-HQ. The funding levels for the individual states range from \$ 90,000 to \$145,000 and were established by ID and HQ based on the prior state teams annual funding levels, the amount and quality of work previously accomplished at these levels, and the amount of productive work remaining to be done.
- B. The FY-84 funding level for the portion of the program to be administered at DOE-ID is \$1,295,000 of the total program funding of \$1,925,000. This level of funding is lower than any of the previous seven years; the amount to be funded in future years is uncertain.
- C. It is the intent of this program to expand the knowledge of higher temperature resources within individual states. This work was performed in previous years by the organizations within each state which were designated by the respective Governor's Office. Any change in contractors at this time would increase costs and delay the program and could only be undertaken with the consent of the Governor's Office in each state.

### 4. Schedule Requirements

- A. The basis for the rapid emplacement of the subject program is the imminent close-out of the agreements DOE now has with several of the organizations we wish to have perform under the FY-84 program. The agreements presently in place are scheduled for various completion dates ranging from almost immediately to September 1984.
- B. It is important to get the work started as soon as possible because the existing expertise may be disbanded if the work presently contracted for is completed prior to the emplacement of this subject program. The existing expertise has been developed to a great extent under the previous DOE-ID contracts and a lapse in DOE funding could result in lack of financial support for the organizations. This cadre of experienced expertise is critical for high quality resource assessment and technology transfer, and it is doubtful that any other organizations can perform as well in the respective states as those which are listed above. Rapid emplacement of this program will help ensure the retention of the existing expertise.
- C. It is doubtful that any savings can be realized or that competition can be increased by relaxing schedules.

5. Exclusive Capacity & Capability

It was determined at the beginning of the previous program to use universities and state agencies to perform the work because these organizations had already performed research in the particular areas, had basic staffs and departments capable of performing the research, and were designated by the state executives. The experience of these organizations has been further enhanced by the work they have conducted for DOE during the past seven years.

RECOMMENDED:

R E Wood

R. E. Wood, Director  
Energy and Technology Division

CONCUR:

George E. Wingerson

George E. Wingerson  
Office of the Chief Counsel

J. F. Marmo 2/5/84

J. F. Marmo, Director  
Contracts Management Division

APPROVED:

Troy E. Wade

Troy E. Wade, Manager  
Idaho Operations Office

2/7/84

Date