

GL00973



Institute of Agriculture
and Natural Resources

THE UNIVERSITY OF NEBRASKA-LINCOLN
INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
LINCOLN, NEBRASKA 68583

CONSERVATION AND SURVEY DIVISION
113 Nebraska Hall
901 North 17th Street
Lincoln, Nebraska 68588

Telephone (402) 472-3471

Geological and Natural Resources Surveys

February 10, 1981

Ms. M. A. Widmayer
Geologic Program Manager
D.O.E.-Idaho Operations
550 Second Street
Idaho Falls, ID 83401

Dear Ms. Widmayer:

Enclosed for your consideration is a proposal to extend our current contract DE-AS07-79ET27205 for an additional two year period (March 31, 1984). Additional funds requested total \$249,979. We believe the success of the current inventory activity merits the expanded program.

Sincerely,

Marvin P. Carlson
Assistant Director

as

cc: Foley ✓

A CONTINUATION OF THE
EVALUATION OF GEOTHERMAL RESOURCES IN NEBRASKA

A Proposal Submitted
to
Division of Geothermal Energy
U.S. Department of Energy
by
University of Nebraska
Lincoln, Nebraska 68588
To Extend Contract DE-AS07-79ET27205
University Account 87-040-562

Administrative Units:

Conservation and Survey Division (State Surveys)
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Department of Geography-Geology
University of Nebraska-Omaha

Proposal Period: Two years starting April 1, 1981
Funding: \$249,979

Principal Investigators:

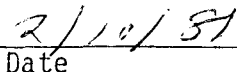
Dr. William D. Gosnold, Jr.; Department of Geography-Geology, UN-O
Mr. Duane A. Eversoll; Nebraska Geological Survey,
Conservation and Survey Division, UN-L

Project Coordinator:

Dr. Marvin P. Carlson, Assistant Director
Conservation and Survey Division
(402) 472-3471



Marvin P. Carlson
Project Coordinator


Date

Introduction

The goals of the State Coupled Resource Assessment Program in Nebraska under the current contract, DE-AS07-79ET27205, which covers the time period April 1, 1979 through March 31, 1981 are as follows:

- (1) Compile existing data on the geothermal regime of Nebraska.
- (2) Drill and log about 30 shallow (150 meter) heat flow holes.
- (3) Prepare appropriate maps to display the results of the study.

These goals have been reached with considerable success and the results of the study indicate the existence of an extensive low-temperature geothermal resource beneath Nebraska as well as several regions with indications of unique heat flow values. These regions are perceived as due to conditions such as large scale flow of warm waters from the Kennedy basin in South Dakota and the Denver Basin in Colorado and Wyoming.

Current knowledge of the resource is general, but that knowledge could be increased and refined considerably by continued investigations. This request summarizes the results of the current study and proposes continued investigations to be conducted as a two year extension to the current contract.

Summary of Results

Existing data were assimilated during the first year of the contract. Data were assembled from a number of published sources including regional heat flow studies (Roy et. al., 1972; Combs and Simmons, 1973; Sass et. al., 1976), a silica-geothermometry study (Swanberg and Morgan, 1979), the A.A.P.G. geothermal gradient map of North America (U.S.G.S., 1976), and geological

studies by the Nebraska and South Dakota geological surveys (Souders, 1976; Schoon and McGregor, 1974). In addition, the compilation of the bottom-hole temperatures of about 13,000 petroleum exploration wells has yielded significant information. During the project, access was obtained and temperature gradients measured in 34 additional shallow holes. Twenty-seven heat flow holes were drilled and logged and the final heat flow determinations are being made.

The interpretation of these data is given in Figure 1 which is essentially a draft of the user-oriented map that is one project goal. The figure is a temperature contour map for a depth of one kilometer with the constraint that the isotherms lie within sedimentary formations that could potentially produce large amounts of water. After three-fourths of Nebraska overlie a potential geothermal resource with temperatures greater than 40°C at a depth of one kilometer. The 50°C isotherm lies at depths ranging from 0.85 to 1.4 kilometers within the resource area and the 40°C isotherm occurs at depths ranging from 0.6 to 1.0 kilometers.

In summary, a general review and inventory has been completed for available data representing the geothermal regime in Nebraska. These data are being compiled into report form and as a general resource map for the state. In addition site specific data have been collected which support the results of the general inventory program.

Proposed Investigation

Although the presence of an extensive low-temperature geothermal resource has been documented in Nebraska significant questions remain about the resource. These questions are relevant to both the technical verification of the geothermal system as well as data enhancement for potential utilization of the resource. The following project areas are proposed for the continuation of the evaluation of the geothermal resources in Nebraska.

1. Bottom-hole Temperatures. The inventory of available bottom-hole temperature (BHT) data has been completed for 85 of the 93 counties in Nebraska. The remaining counties have large concentrations of data related to productive oil and gas fields. Selected data has been reviewed in these local areas and could be summarized for input suitable for regional analysis. However, these local data sets could provide valuable insight into substate aquifer systems. It is proposed to accomplish a complete inventory rather than to select representative data. All BHT data along with pertinent time and depth information will have been compiled and stored on the Division's internal computing system. Output programs have been installed and tested which can provide the tabulation products relevant to resource assessment.
2. Aquifer Characteristics. Although Nebraska has an abundance of high-yield, good quality aquifer systems, potential quantity/quality limitations should be characterized for substate regions. It is proposed to assemble the available water quality data and relate these data to the appropriate geothermal systems. The petroleum industry has performed a large number of drill-stem-tests for some of the deeper aquifer systems which could indicate local flow potential. To the extent possible, these quality/quantity data will be interpreted as to their influence on aquifer utilization for a geothermal resource. Products will include tables, maps, and diagrams pertinent to a user audience.
3. Well Logging-Field Verification. The heat flow patterns delineated during the current inventory have been substantiated by logging of actual temperature gradients in both shallow and deep wells. Available water supply wells and water level observation wells were measured in addition to those test wells drilled specifically for temperature measurement. It is proposed to continue this data inventory of shallow temperature gradients

to more specifically define substate areas. During our current contract, a pilot study investigated the availability of selected deep wells. In cooperation with the Nebraska Oil and Gas Commission, four deep wells were selected and logged at our request by the University of Wyoming. The results from these logs are given in Figures 2-6 and confirm the existence of the high subsurface temperature projected for the area. It is proposed to expand this data gathering activity to both verify site-specific conditions and to further document our other inventory programs.

4. Computer-oriented Data Translation. A variety of state-wide data sets have been assembled which could be relevant to inventory and assessment of geothermal resources. These include direct character measurement as well as indirect tabulations of geophysical data. An example of the latter are the large number of regional data sets for gravity data. The BHT and drillstems test data generated by the petroleum industry are other examples. It is proposed to collect, evaluate qualitatively and integrate these data sets into our resource assessment program. A major analytical effort will be applied by integrating the BHT data with the deep well logging activity. The inherent limitations of the BHT data from the petroleum industry forestall direct utilization for resource assessment although there are uniform characteristics within the data set. As the result of the other ongoing project activities, Nebraska will have a complete inventory of BHT data tied to the geohydrological framework as well as a selected base of measured deep well temperature data. All of these data will be computer-compatible. It is proposed to use these Nebraska data to develop software programs for translating the industry data into real value temperature information. The success of these programs would allow this capability to be applied by other states which have undergone petroleum explorations

5. Public Service and User Application. During the current program the general public, through the media, have been kept informed of the project activity. Both the field projects and press releases have created interest from the potential user audience. A major product will be the 1:500,000 state maps currently being compiled. The subprojects proposed under the extended program will allow products to be produced for both substate regions and for potential methodology of utilization. The data collection and interpretation projects should allow the preparation of aquifer maps in response to local interests. Both project data and material available nationally will be utilized to prepare information brochures pertinent to potential Nebraska utilization of geothermal energy.

Budget Detail: April 1, 1981-March 31, 1983

Wages (Percent of effort-Two Years)		88,962
Geophysicist	45%	21,862
Research Ass't	100%	29,500
Programmer	15%	9,600
Hourly		28,000
Benefits (14%)		12,455
Contractual Services		50,000
Deep well logging		40,000
Geophysical Analysis		10,000
Operations		15,500
Expendable Supplies		2,000
Report preparation		3,500
Computer time		10,000
Travel		15,100
Transportation		9,000
Subsistance		6,100
Total Direct		182,017
Indirect (UNO-37%, UNL-38%)		67,962
Total Budget		249,979

During the period April 1, 1981 to March 31, 1983 the University of Nebraska will contribute \$25,000 in costs to this investigation by supporting the efforts provided by the following University staff.

Marvin P. Carlson, Project Coordinator	\$ 9,000
William D. Gosnold, Jr., Principal Investigator	12,000
Duane A. Eversoll, Principal Investigator	4,000

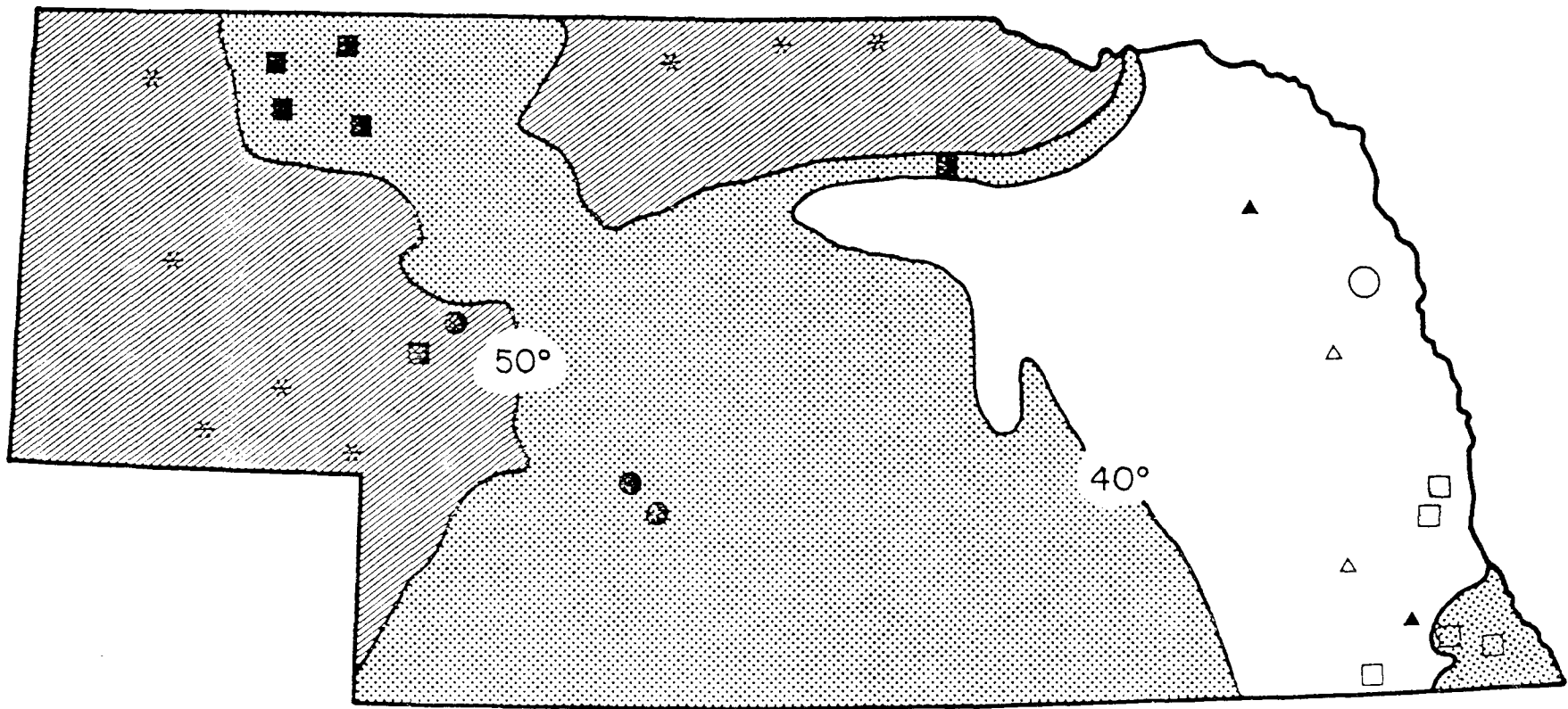


Figure 1. The temperature contours indicate where the 40 and 50 °C isotherms lie at a depth of one kilometer and in a sedimentary formation that could produce water. The symbols are heat flow data.

Key: (Units are mW/m^2) \circ = 30-50; \square = 50-60; \triangle = 60-70; \bullet = 70-80;
 \blacksquare = 80-100; \blacktriangle = 100-120; $*$ > 120.

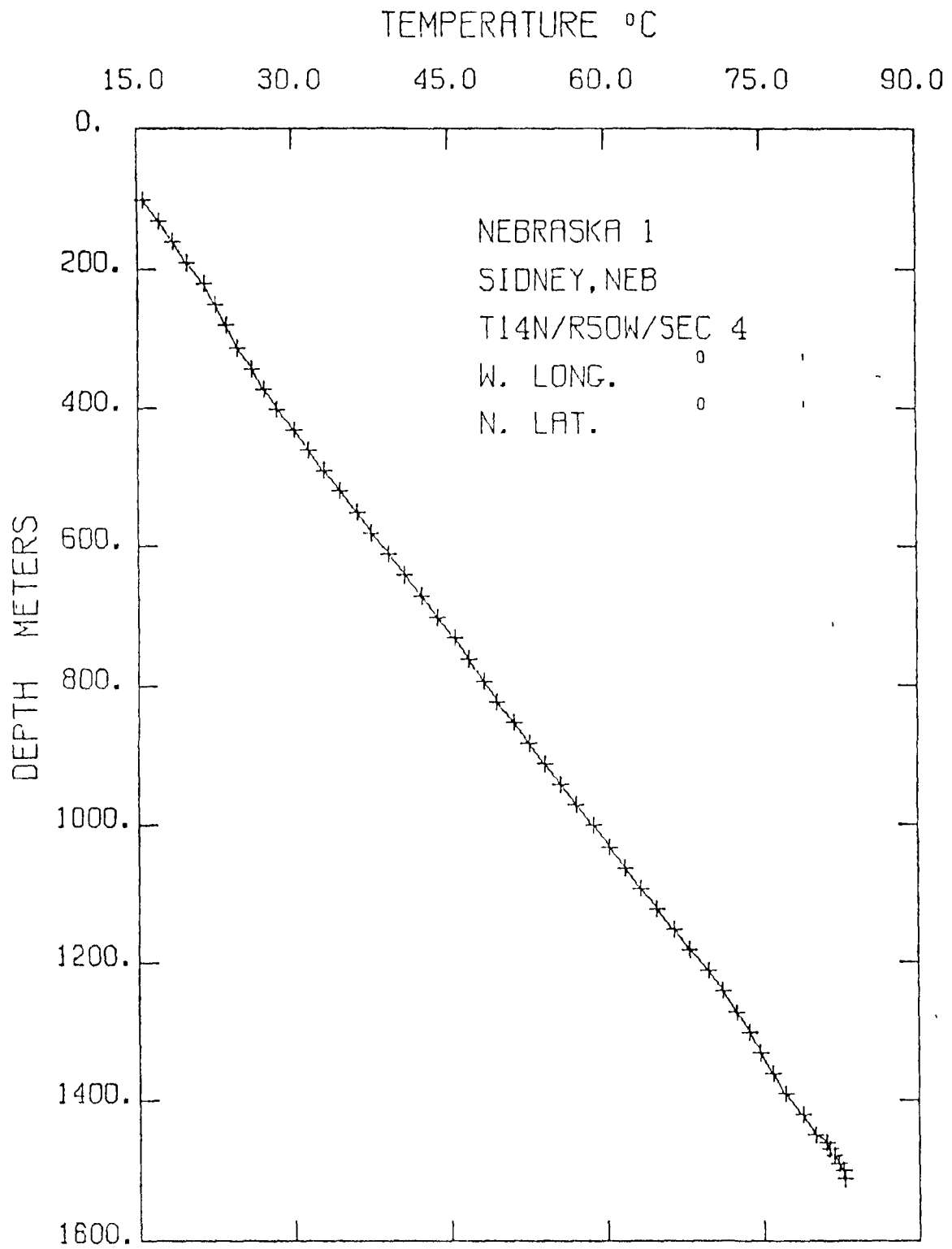


Figure 2

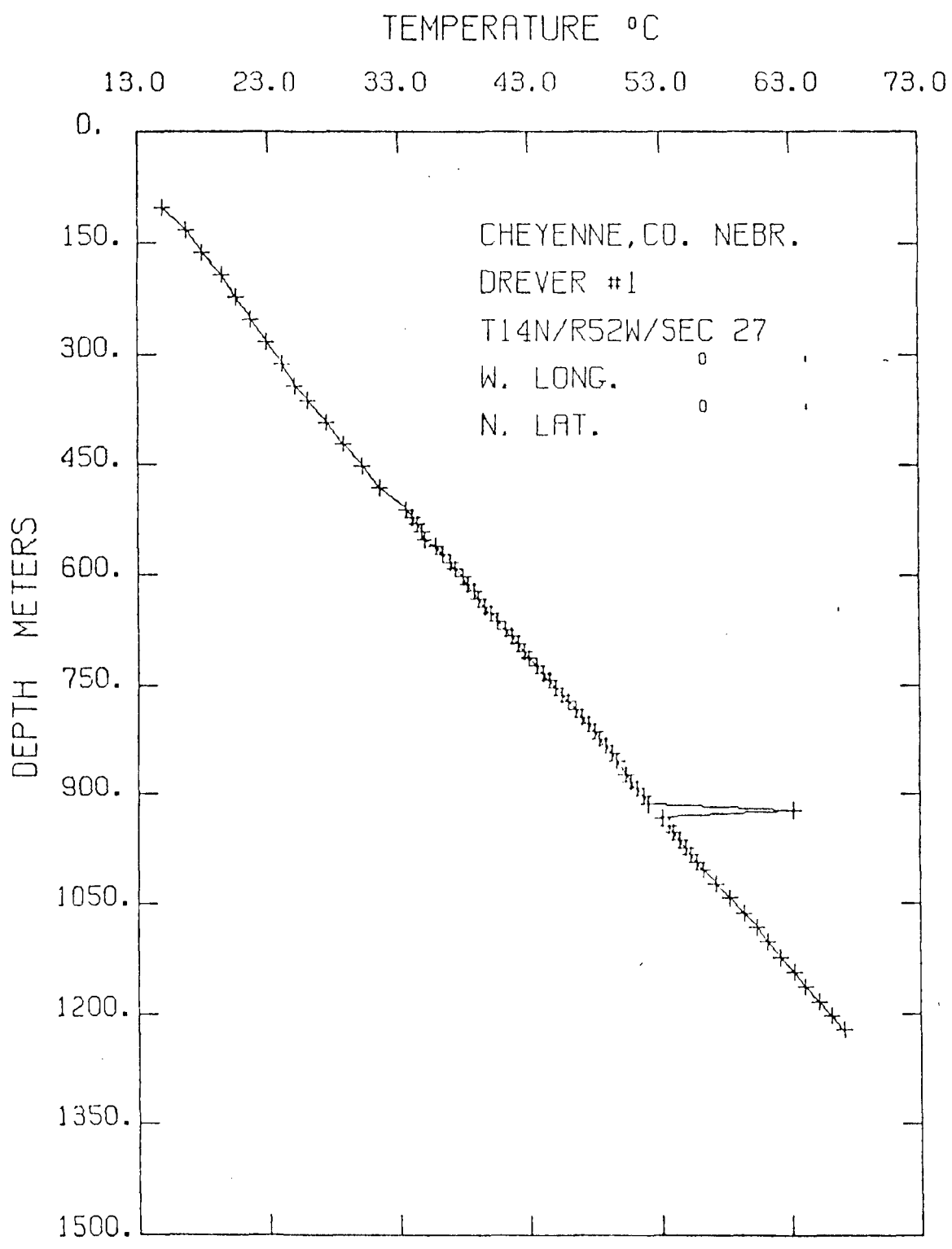


Figure 3

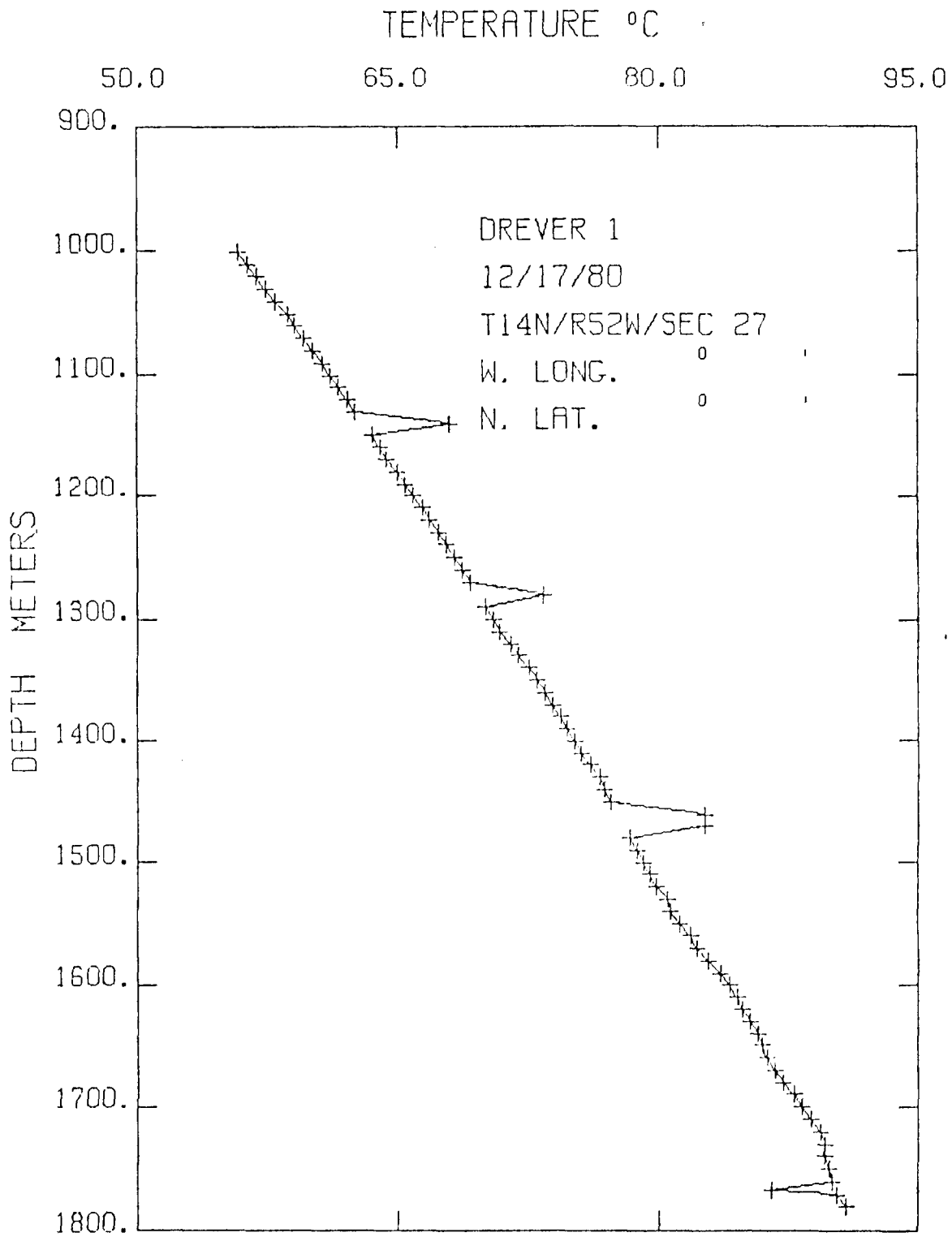


Figure 4

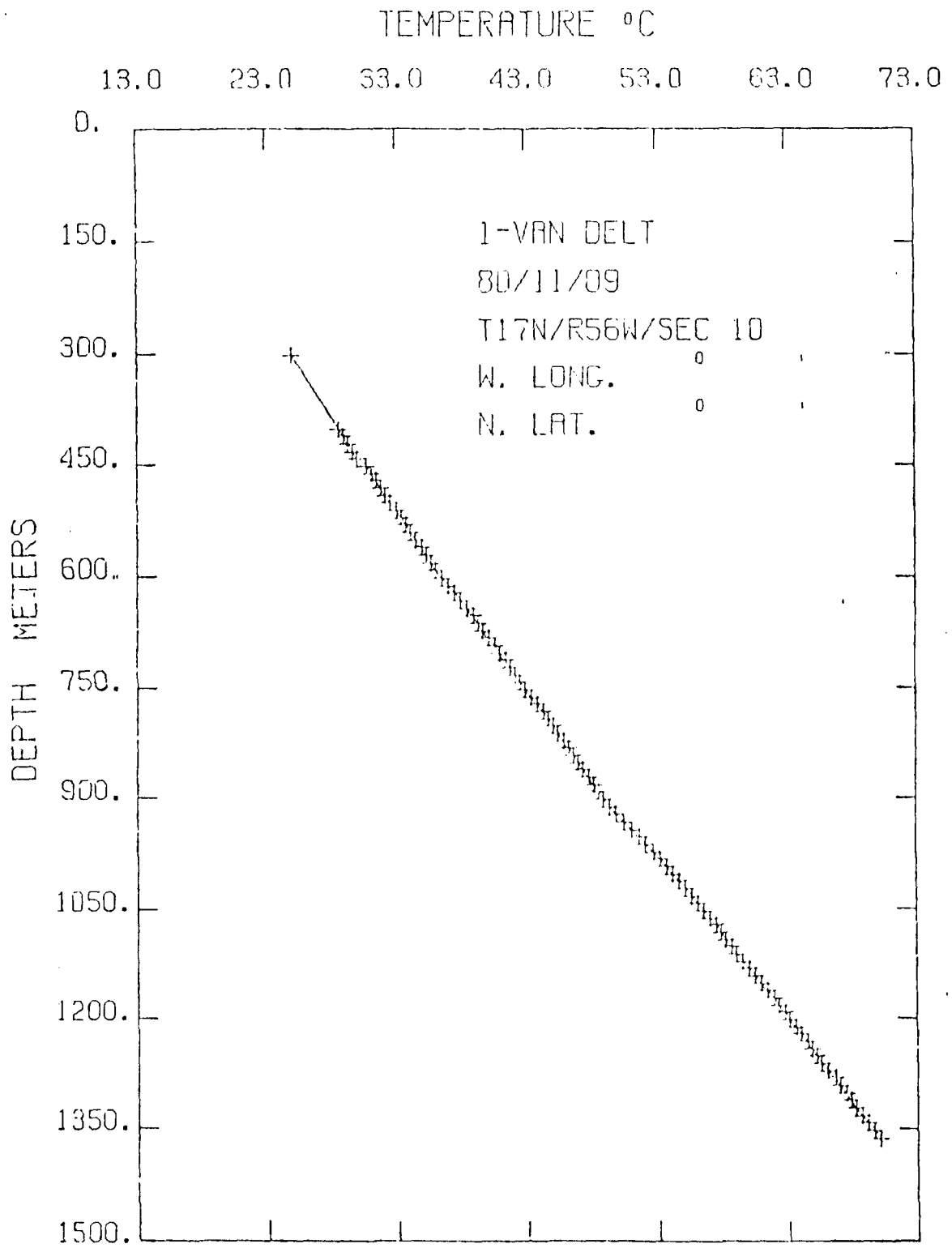


Figure 5

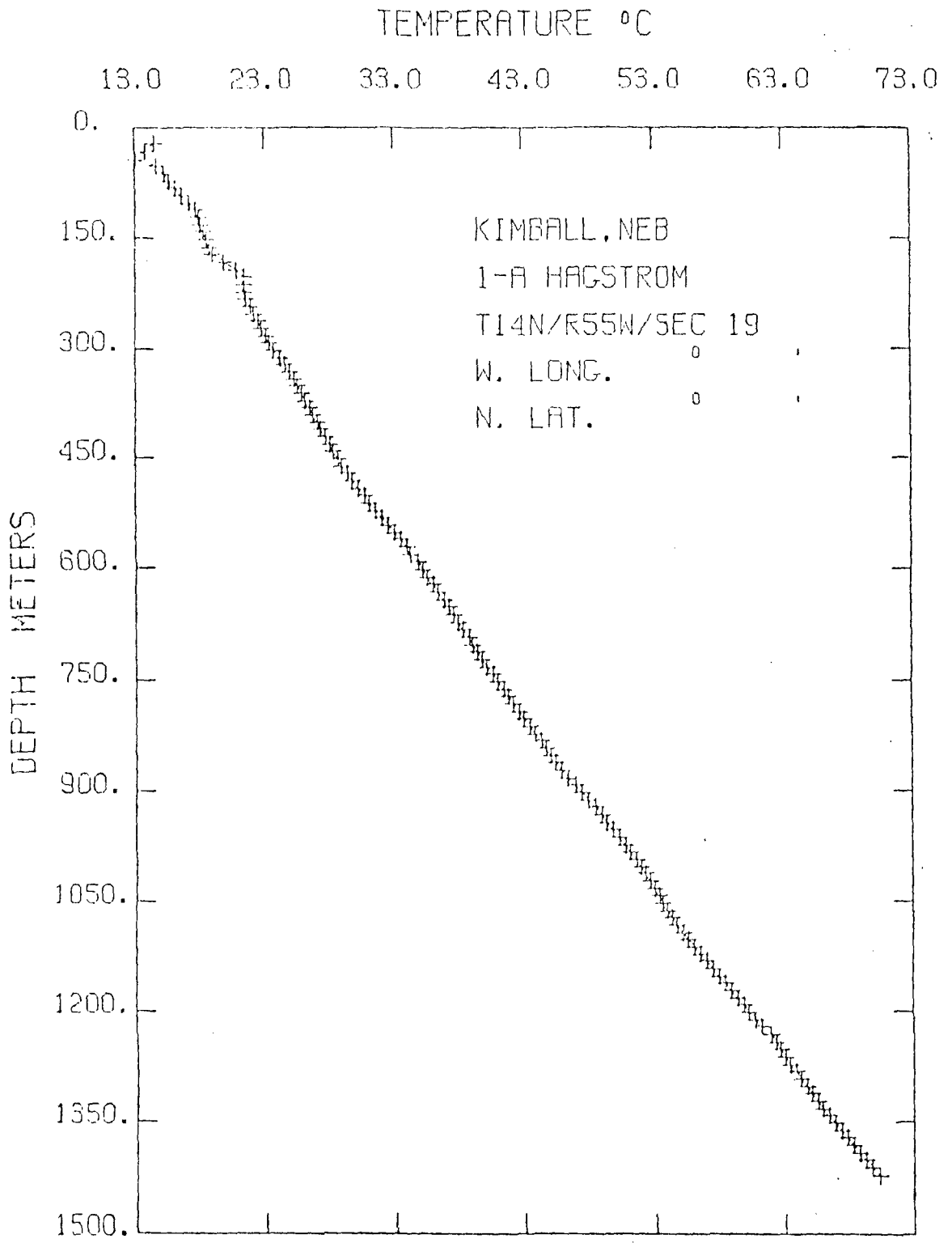


Figure 6

File M.2.19

Contract No. DE-AS07-79ET27205

CONTRACT BETWEEN
UNIVERSITY OF NEBRASKA
AND
THE DEPARTMENT OF ENERGY

THIS CONTRACT, entered into the _____ day of _____ 1979 (effective as of April 1, 1979), by and between the UNITED STATES OF AMERICA (hereinafter called the "Government"), acting through the DEPARTMENT OF ENERGY (hereinafter called "DOE"), and the UNIVERSITY OF NEBRASKA (hereinafter called the "Contractor");

WITNESSETH THAT:

WHEREAS, DOE desires to have the Contractor perform certain research work, as hereinafter provided; and

WHEREAS, this contract is authorized by Section 302(c)(5) of the Federal Property and Administrative Services Act of 1949, as amended, and the Department of Energy Organization Act of 1977 (Public Law 95-91), and other applicable laws;

NOW, THEREFORE, the parties hereto agree as follows:

ARTICLE I - THE RESEARCH TO BE PERFORMED

A. The Contractor shall, to the best of its ability, furnish personnel, facilities, equipment, materials, supplies, and services, except such as are furnished by the Government, necessary for the performance of the research provided for in Appendix A hereto, and shall perform the research and report thereon pursuant to the provisions of this contract. It is understood that Appendix A, a guide to the performance of this contract, may be deviated from by the Contractor subject to the specific requirements of this contract.

B. This work shall be conducted under the direction of Marvin P. Carlson and Duane A. Eversoll or such other member(s) of the Contractor's staff as may be mutually satisfactory to the parties.

ARTICLE II - THE PERIOD OF PERFORMANCE

The period of performance under this contract shall commence on April 1, 1979 and expire on or about March 31, 1981. Performance may be extended for additional periods by the mutual written agreement of the parties.

071179
br:19L:A-2

ARTICLE III - CONSIDERATION

A. In full consideration of the Contractor's performance hereunder, DOE shall furnish the equipment, supplies, materials, and services, if any, listed in Article A-II(b)(2), and pay the Contractor the sum of Seventy-Seven Thousand Two Hundred Forty Dollars (\$77,240.00), which excludes \$4,000 for Government property to be procured by the Contractor. This sum is hereinafter called the "Support Ceiling," which shall be subject to adjustment as hereinafter provided.

B. Payments to the Contractor shall equal the "Cumulative Support Cost" of the performance of this contract, as the term "Cumulative Support Cost" is defined in Article B-V of Appendix B; Provided, however, and notwithstanding any other provisions of this contract, that the Government's monetary liability under this contract shall not exceed the Support Ceiling specified in paragraph A. above. DOE shall not pay more than the Support Ceiling or an amount equal to the Cumulative Support Cost, whichever is less. The Contractor shall be obligated to perform under this contract throughout the agreed-upon period of performance, and to bear all costs which DOE has not agreed to pay; Provided, however, that the Contractor shall have the right to cease to perform the research provided for in this contract, upon written notice to DOE to that effect, at any time when or after the Cumulative Support Cost equals or exceeds the Support Ceiling.

C. The Support Ceiling specified in paragraph A. above, may be increased unilaterally by DOE by written notice to the Contractor and may be increased or decreased by written agreement of the parties (whether or not by formal modification to this contract). In the event the stated period of contract performance is extended, the Support Ceiling may be revised to reflect any increased DOE support for the extended period or periods.

D. Upon termination, or expiration of the total period of performance, the Contractor shall promptly refund to DOE (or make such disposition as DOE may in writing direct) any sums paid by DOE to the Contractor under this contract, through direct payment or under letter of credit, in excess of the Cumulative Support Cost incurred in performance under the contract.

ARTICLE IV - GOVERNMENT PROPERTY

The following items of property procured or fabricated by the Contractor are hereby listed as "Government property":

Digital Meters
Thermistors
Stable Temperature Baths
Refrigeration Unit

ARTICLE IV - GOVERNMENT PROPERTY (Cont'd)

This equipment shall be procured by the Contractor at an amount not to exceed \$4,000 for the account of the Government. This sum is in addition to the "Support Ceiling" specified in Article III, Consideration, and shall be treated and accounted for separately as regarding the terms of this contract.

ARTICLE V - DATE OF INCURRENCE OF COSTS

The Contractor shall be entitled to reimbursement for costs incurred in an amount not to exceed \$40,000 on or after April 1, 1979, which, if incurred after this contract had been entered into, would have been reimbursable under the provisions of this contract.

ARTICLE VI - ADDITIONAL CONTRACT PROVISIONS

Appendix B attached hereto and made a part hereof, sets forth additional general contract provisions of this contract.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

THE UNITED STATES OF AMERICA

BY THE DEPARTMENT OF ENERGY

Original Signed By:
Lois D. Anderson

By _____

Contracts Management Division
Idaho Operations Office
Contracting Officer

UNIVERSITY OF NEBRASKA

Witnesses as to signature of
Contractor:

By _____

(Name Typed)

(Signature)

Title _____

Name (typed)

(Business Address)

(Address)

(Signature)

Name (typed)

(Address)

CONTRACTOR: UNIVERSITY OF NEBRASKA

APPENDIX A

Article A-I - RESEARCH TO BE PERFORMED BY CONTRACTOR

The Contractor is responsible to assure that the following tasks are accomplished in a manner consistent with the provisions of this contract.

- Task I: Establish a temperature data bank from logs of approximately 13,000 oil and gas wells drilled in Nebraska. Collect information on aquifer temperatures and water quality from existing files.
- Task II: Drill approximately 30 shallow (150 m) holes for obtaining thermal gradient information as indicated from Task I data analysis. Run geophysical logs and analyze borehole cuttings.
- Task III: Prepare appropriate maps and sections to display the data acquired under Tasks I and II.
- Task IV: Reporting

The reporting requirements are detailed in the attached Reporting Requirements Checklist and Report Distribution List.

Article A-II - WAYS AND MEANS OF PERFORMANCE

(a) Items for which support will be provided as indicated in Article A-III:

(1) Salaries and Wages	\$51,498
(2) Equipment (see Article IV, <u>Government Property</u>)	-0-
(3) Travel (domestic)	13,000
(4) Other Direct Costs	59,000
(5) Indirect Costs	<u>38,345</u>
TOTAL	\$161,843

(b) Items, if any, significant to the performance of this contract, but excluded from computation of Support Cost and from consideration in proportioning costs:

- (1) To be contributed by Contractor:
Marvin P. Carlson - \$5,500 salary
- (2) To be contributed by DOE: None

Article A-II - WAYS AND MEANS OF PERFORMANCE (Cont'd)

(c) Time or effort of Principal Investigator(s) including indirect cost and fringe benefits contributed by the Contractor but excluded from computation of Support Cost and consideration in proportioning costs:

Duane A. Eversoll - \$11,500

(d) The Contractor shall maintain records adequate to permit DOE to determine the extent of the contribution as indicated in (b) and (c) above.

Article A-III - FUNDING

The total estimated cost to DOE for the performance of work under Article A-II above is One Hundred Sixty-One Thousand Eight Hundred Forty-Three Dollars (\$161,843.00). An amount of Seventy-Seven Thousand Two Hundred Forty Dollars (\$77,240.00) is hereby obligated for the period from April 1, 1979 through September 30, 1979. The balance of Eighty-Four Thousand Six Hundred Three Dollars (\$84,603.00) will be obligated when and if such funds become available. The Contractor shall perform the research set forth under Article A-I under 90% of the obligated One Hundred Sixty-^{ONE}~~SIX~~ Thousand Eight Hundred Forty-Three Dollars (~~\$166,843.00~~) is reached. At that time, the Contractor shall discontinue work and notify DOE that work has been stopped until additional funds are authorized. If the balance of Eighty-Four Thousand Six Hundred Three Dollars (\$84,603.00) will not be authorized, DOE will notify the Contractor in writing and at that time the Contractor shall submit a final report for the work that has been performed. The Four Thousand Dollars (\$4,000.00) identified in Article IV, Government Property, is a separate and complete obligation. DOE will pay 100% of the actual costs enumerated in Article A-II subject to the provisions contained in this article, Article III, and Article B-V.

165,843
77,240 FY79
88,603 FY80
<4,000>CE
84,603
<8460>
76,143

Article A-IV - DOE TECHNICAL ADMINISTRATOR

L. L. Mink
Energy and Technology Division
Idaho Operations Office
Telephone: 208-526-0638

U. S. DEPARTMENT OF ENERGY
REPORTING REQUIREMENTS CHECKL

DE Form CR-537
 (1-78)

(See Instructions on Reverse)

FORM APPROVED
 OMB NO. 38R-0190

1. IDENTIFICATION An Evaluation of the Geothermal Resources in Nebraska	2. OBLIGATION INSTRUMENT: DE-AS07-79ET27205
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REPORTING REQUIREMENTS

PROJECT MANAGEMENT	Frequency	B. TECHNICAL INFORMATION REPORTING	Frequency
1. <input type="checkbox"/> Management Plan 2. <input type="checkbox"/> Milestone Schedule & Status Report 3. <input type="checkbox"/> Cost Plan 4. <input type="checkbox"/> Manpower Plan 5. <input checked="" type="checkbox"/> Contract Management Summary Report 6. <input checked="" type="checkbox"/> Project Status Report 7. <input checked="" type="checkbox"/> Cost Management Report 8. <input type="checkbox"/> Manpower Management Report 9. <input type="checkbox"/> Conference Record 0. <input type="checkbox"/> Hot Line Report	 M M Q	1. <input checked="" type="checkbox"/> Notice of Energy RD&D Project (SSIE) 2. <input checked="" type="checkbox"/> Technical Progress Report 3. <input type="checkbox"/> Topical Report 4. <input checked="" type="checkbox"/> Final Technical Report C. PMS/MINI-PMS 1. Cost Performance Report <input type="checkbox"/> Format 1 WBS <input type="checkbox"/> Format 2 Functional <input type="checkbox"/> Format 3 Baseline <input type="checkbox"/> Format 5 Problem Analysis 2. <input type="checkbox"/> Cost/Schedule Status Report 3. <input type="checkbox"/> Management Control System Description 4. <input type="checkbox"/> Summary System Description 5. <input type="checkbox"/> WBS Dictionary	 O M F

FREQUENCY CODES:

A - As Required	Q - Quarterly
C - Contract Change	S - Semi-Annually
F - Final (End of Contract)	X - Mandatory for Delivery with Proposals/Bid
M - Monthly	Y - Yearly or Upon Contract Renewal
O - One Time (Soon After Contract Award)	

SPECIAL INSTRUCTIONS

ATTACHED HEREWITH:

<input checked="" type="checkbox"/> Report Distribution List	<input type="checkbox"/>
<input type="checkbox"/> WBS/Reporting Category	<input type="checkbox"/>

PREPARED BY (Signature and date):	7. REVIEWED BY (Signature and date):
-----------------------------------	--------------------------------------

cc: 7510 CMD

1. AMENDMENT/MODIFICATION NO. **A001**

2. EFFECTIVE DATE

3. REQUISITION/PURCHASE REQUEST NO. **07-80ET27205.502**

4. PROJECT NO. (If applicable)

5. ISSUED BY **U. S. Department of Energy
Idaho Operations Office
550 Second Street
Idaho Falls, Idaho 83401**

6. ADMINISTERED BY (If other than block 5)

7. CONTRACTOR NAME AND ADDRESS **University of Nebraska
304 Admin., 14th & R Streets
Lincoln, NE 68588
ATTN: R. W. Wright, Vice Chancellor
for Business & Finance**

8. AMENDMENT OF SOLICITATION NO. _____

DATED _____ (See block 9)

MODIFICATION OF CONTRACT/ORDER NO. **DE-AS07-79ET27205**

DATED **9-4-79** (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.

Offers 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 ACKNOWLEDGMENT 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)

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.

This Supplemental Agreement is entered into pursuant to authority of **Article A-III of Contract Appendix A**

It modifies the above numbered contract as set forth in block 12.

DESCRIPTION OF AMENDMENT/MODIFICATION

1. The Support Ceiling in Article III - CONSIDERATION is increased from \$77,240.00 to \$161,843.

2. Article A-III - FUNDING, Appendix A, is modified as follows:

The amount of funds obligated by DOE is One Hundred Sixty-five Thousand Eight Hundred Forty-three Dollars (\$165,843.00). This is composed of:

Original Contract:	
Equipment	\$ 4,000.00
Support Ceiling	77,240.00
	<u>\$ 81,240.00</u>
This Modification A001	\$ 84,603.00
TOTAL	<u>\$165,843.00</u>

P.2 missing?

As provided herein, all terms and conditions of the document referenced in block 8, as hereinafter 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 _____ COPIES TO ISSUING OFFICE

17. UNITED STATES OF AMERICA

BY **Neil W. Fraser** (Signature of Contracting Officer)

18. NAME OF CONTRACTING OFFICER (Type or print) **Neil W. Fraser**

19. DATE SIGNED **6/26/80**

17.2.19

MAR 10 1981

University of Nebraska
304 Admin., 14th & R Streets
Lincoln, Nebraska 68588

ATTENTION: R. W. Wright, Vice Chancellor
for Business & Finance

SUBJECT: MODIFICATION NO. M002 TO CONTRACT NO. DE-AS07-79ET27205

Gentlemen:

Enclosed for your retention and files is one fully executed copy of
the subject modification.

Very truly yours,

(srd.) William C. Drake

William C. Drake
Contracting Officer
Chief, R&D Contracts Branch
Contracts Management Division

Enclosure

bcc: E. G. Jones, w/enc.
R. L. Combs, w/enc.
M. A. Widmayer, w/enc.

RECEIVED

1981

GEOHERMAL ENERGY
BRANCH

R&DCB
GCHolan
3-10-81

R&DCB
KRHastings

R&DCB
WCDrake

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. AMENDMENT/MODIFICATION NO. M002	2. EFFECTIVE DATE 3-31-81	3. REQUISITION/PURCHASE REQUEST NO. 07-81ET27205.501	4. PROJECT NO. (If applicable)
---------------------------------------	------------------------------	---	--------------------------------

5. ISSUED BY U. S. Department of Energy Idaho Operations Office 550 Second Street Idaho Falls, Idaho 83401	6. ADMINISTERED BY (If other than block 5)
--	--

7. CONTRACTOR NAME AND ADDRESS University of Nebraska 304 Admin., 14th & R Streets Lincoln, Nebraska 68588 Attn: R. W. Wright, Vice Chancellor for Business & Finance	8. AMENDMENT OF SOLICITATION NO. _____ DATED _____ (See block 9) MODIFICATION OF CONTRACT/ORDER NO. DE-AS07-79ET27205 DATED 9-4-79 (See block 11)
--	--

9. 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.

10. ACCOUNTING AND APPROPRIATION DATA (If required)

11. 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 mutual agreement of the parties.
It modifies the above numbered contract as set forth in block 12.

12. DESCRIPTION OF AMENDMENT/MODIFICATION

Article II - THE PERIOD OF PERFORMANCE is amended as follows:

"The period of performance of the research under this contract is extended to April 21, 1981."

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.

13. CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN _____ COPIES TO ISSUING OFFICE

14. NAME OF CONTRACTOR/OFFEROR	17. UNITED STATES OF AMERICA
BY _____ (Signature of person authorized to sign)	BY <u>William C. Drake</u> (Signature of Contracting Officer)

15. NAME AND TITLE OF SIGNER (Type or print)	16. DATE SIGNED	18. NAME OF CONTRACTING OFFICER (Type or print)	19. DATE SIGNED
		William C. Drake	3/10/81

APR 21 1981

RECEIVED

APR 24 1981

GEOHERMAL ENERGY
BRANCH

University of Nebraska
113 Nebraska Hall
Conservation and Survey Division
Lincoln, Nebraska 68588

ATTENTION: Marvin P. Carlson

SUBJECT: PROPOSED MODIFICATION NO. A003 TO CONTRACT NO. DE-AS07-79ET27205

Gentlemen:

You are hereby authorized effective April 21, 1981, to begin work and incur costs up to a maximum of \$50,000 under the proposed contract modification pending execution of the formal contract. Work is to be performed in accordance with your proposal submitted to this office dated February 10, 1981.

The resulting modification will include the following article:

"Date of Incurrence of Costs - The contractor shall be entitled to reimbursement for costs incurred in an amount not to exceed \$50,000 on or after April 21, 1981, which, if incurred after this contract modification had been entered into, would have been reimbursable under the provisions of this contract."

In the event the University and the Government are unable to reach agreement and a modification is not executed, the Government shall not be liable for any obligations arising out of this letter.

Please indicate your acceptance of this action by signing in the space indicated below and returning one copy to this office.

If you have any questions, please contact Kent R. Hastings of my staff at telephone 208-526-1510.

Very truly yours,

Nell W. Fraser
Contracting Officer
Director, Contracts Management Division

ACCEPTED:

Name _____

Title _____

Date _____

bcc: M. A. Widmayer ✓
E. G. Jones

File
M 2, 19

NEBRASKA

MAY 2 1981

University of Nebraska
113 Nebraska Hall
Conservation and Survey Division
Lincoln, Nebraska 68588

ATTENTION: Marvin P. Carlson

SUBJECT: MODIFICATION NO. A003 TO CONTRACT NO. DE-AS07-79ET27205

Gentlemen:

Enclosed are four copies of the subject modification. If this modification is satisfactory to you, please have three copies signed by an authorized official and return them to this office for execution by DOE. The fourth copy is for your files pending receipt of one fully executed copy.

DOE's Technical Administrator is now Michael K. Tucker who can be reached on (208) 526-3180. Administration of the Contract is being done by Kent R. Hastings, his telephone number is (208) 526-1510.

Very truly yours,

WILLIAM C. DRAKE

William C. Drake
Contracting Officer
Chief, R&D Contracts Branch
Contracts Management Division

Enclosure (4)

bcc: M. K. Tucker ✓

R&DCB
KRHastings
5/28/81

R&DCB
WCDrake

RECEIVED
MAY 28 1981
GEOTHERMAL ENERGY
BRANCH

STANDARD FORM 30, JULY 1966 GENERAL SERVICES ADMINISTRATION FED. PROC. REG. (41 CFR) 1-16.101		AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		PAGE 1	OF 2
1. AMENDMENT/MODIFICATION NO. A003		2. EFFECTIVE DATE		3. REQUISITION/PURCHASE REQUEST NO.	
4. PROJECT NO. (If applicable)		5. ISSUED BY U. S. Department of Energy Idaho Operations Office 550 Second Street Idaho Falls, Idaho 83401		6. ADMINISTERED BY (If other than block 5) CODE	
7. CONTRACTOR NAME AND ADDRESS University of Nebraska 304 Admin., 14th & R Streets Lincoln, Nebraska 68588 Attn: R. W. Wright, Vice Chancellor for Business & Finance		8. AMENDMENT OF SOLICITATION NO. DATED _____ (See block 9)		MODIFICATION OF CONTRACT/ORDER NO. DE-AS07-79ET27205 DATED 9-4-79 (See block 11)	
9. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS <input type="checkbox"/> The above numbered solicitation is amended as set forth in block 12. The hour and date specified for receipt of Offers <input type="checkbox"/> is extended, <input type="checkbox"/> 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.					
10. ACCOUNTING AND APPROPRIATION DATA (If required)					
11. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS (a) <input type="checkbox"/> This Change Order is issued pursuant to _____ The Changes set forth in block 12 are made to the above numbered contract/order. (b) <input type="checkbox"/> 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) <input checked="" type="checkbox"/> This Supplemental Agreement is entered into pursuant to authority of <u>Public Law 95-91, and other applicable laws.</u> It modifies the above numbered contract as set forth in block 12.					
12. DESCRIPTION OF AMENDMENT/MODIFICATION (a) <u>ARTICLE I - THE RESEARCH TO BE PERFORMED</u> is amended by adding a new paragraph as follows: "Appendix A3, attached to this Supplemental Agreement and made a part hereof, provides for the research to be performed by the Contractor during the contract period specified therein." (b) <u>ARTICLE II - THE PERIOD OF PERFORMANCE</u> is amended as follows: "The period of performance for the work performed under this Supplemental Agreement shall commence on April 21, 1981, and expire on March 31, 1983. The period of time for performing the research work under Appendix A3 may be extended for additional periods by the mutual written agreement of the parties."					
(Continued)					
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.					
13. <input type="checkbox"/> CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT <input checked="" type="checkbox"/> CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN <u>3</u> COPIES TO ISSUING OFFICE					
14. NAME OF CONTRACTOR/OFFEROR BY _____ (Signature of person authorized to sign)			17. UNITED STATES OF AMERICA BY <u>William C. Drake</u> (Signature of Contracting Officer)		
15. NAME AND TITLE OF SIGNER (Type or print) John W. Goebel, Interim Vice Chancellor for Business & Finance		16. DATE SIGNED 9/10/81	18. NAME OF CONTRACTING OFFICER (Type or print) William C. Drake		19. DATE SIGNED 9/21/81

- (c) ARTICLE III - CONSIDERATION, paragraph A. is hereby revised to increase the contract Support Ceiling by Two Hundred Forty-Nine Thousand Nine Hundred Seventy-Nine Dollars (\$249,979) to a new total Support Ceiling of Four Hundred Fifteen Thousand Eight Hundred Twenty-Two Dollars (\$415,822.00).
- (d) A new ARTICLE VII - DATE OF INCURRENCE OF COSTS is hereby added to the contract as follows:

"ARTICLE VII - DATE OF INCURRENCE OF COSTS

The contractor shall be entitled to reimbursement for costs incurred in an amount not to exceed \$50,000 on or after April 21, 1981, which, if incurred after this modification had been entered into, would have been reimbursable under the provisions of the Modification."

CONTRACTOR: UNIVERSITY OF NEBRASKA

APPENDIX A3

For the contract period April 21, 1981 through March 31, 1983

Article A-1 - RESEARCH TO BE PERFORMED BY CONTRACTOR

- (a) The statement of research to be performed by the Contractor is the following:

Task 1 Bottomhole Temperature Survey

Complete the survey of all counties in Nebraska for available bottomhole temperature data. Produce a map at a scale of 1:500,000 showing all available bottomhole information. Produce a contour map depicting temperature versus depth will accompany a summary report of the implications of these data to geothermal development. This report will be part of the final report for this contract work.

Task 2 Heat Flow and Temperature Gradient Survey

In order to supplement and verify the existing heat flow and temperature gradient data base, continued measurements of both shallow and deep holes-of-opportunity will be obtained. Studies will be focused on areas with little data control, and in areas which have a user population base and suspected geothermal potential. Information obtained from this survey will be incorporated in the existing data base and presented in the final report by a summary interpretation of the data as a geothermal exploration method in Nebraska.

Task 3 Data Translation Studies

Generate computer programs to define relationships between the inventory of bottomhole temperature data, known geohydrology, and measured deep well temperature data. Uniform characteristics within and between data sets will be defined, i.e., making a translation of petroleum industry bottomhole temperature data into real value temperature information. Software programs will be available as part of the final product along with a summary interpretation of the validity, application, and drawbacks of these data set integrations as they relate to geothermal potential in Nebraska.

Task 4 Gravity Map

Compile existing gravity data for the state on a map of 1:500,000 with a contour interval at least 5 miligals. Compare

the gravity map with existing basement crystalline maps; make an integrated interpretation of the gravity data as it relates to the basement contour configuration and to geothermal potential in Nebraska. Include these maps and interpretations in the final report.

Task 5 Substate Region Investigations

Compile all available geoscience information pertinent to geothermal resource assessment and interpret it for 4 (four) select substate regions of the state. Substate regions will be selected based on geothermal potential and population density. Each investigation will include discussions and interpretations of heat flow, thermal gradient, and bottomhole temperature data, available geological, structural, and geophysical data, aquifer characterization studies to include discussions of water quality and productivity of potential local geothermal aquifers, and a comprehensive bibliography of available geoscience information for the area as it relates to geothermal potential. Each investigation will result in a formal technical document and a user-oriented synthesis of the geothermal potential for the area.

Task 6 Dissemination of Information

Disseminate geoscience information about the resource in the state. As part of this task, the resource team will work with other DOE contractors (i.e., EG&G, Idaho, University of Utah Research Institute (UURI), and New Mexico Energy Institute) to prepare and distribute information brochures pertinent to potential Nebraska utilization of geothermal energy.

Task 7 State Geothermal Map

A user-oriented state geothermal resources map will be compiled using all available geoscience information. Map preparation and production will be accomplished as a cooperative effort with NOAA. A draft proof map will be available by October, 1981 for review prior to publication.

Task 8 Reporting Requirements

Reports are required in accordance with the attached DOE Form CR-537 and Report Distribution List.

- (b) The scope of work shall include other studies, investigations, and services as may be mutually agreed upon.

Article A-II - WAYS AND MEANS OF PERFORMANCE

(a) Items for which support will be provided as indicated in Article A-III:

(1) Direct Salaries and Wages:

Geophysicist 45% of time	\$ 21,862
Research Assistance 100% of time	29,500
Programmer 15% of time	9,600
Hourly	<u>\$ 28,000</u>
Total Direct Salaries and Wages	\$ 88,962

Fringe Benefits @ 14% DL	<u>12,455</u>
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Subtotal	\$101,417
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(2) Travel - Transportation 9,000

Subsistence	<u>6,100</u>
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Subtotal	\$ 15,100
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(3) Consultants/Subcontracts

Deep Well Logging	40,000
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Geophysical Analysis	<u>10,000</u>
----------------------	---------------

Subtotal	\$ 50,000
----------	-----------

(4) Other Direct Costs

Expendable Supplies	2,000
---------------------	-------

Report Preparation	3,500
--------------------	-------

Computer Time	<u>10,000</u>
---------------	---------------

Subtotal	<u>\$ 15,500</u>
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Total Direct Costs	\$182,017
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(5) Indirect costs @ 38%-UNL; 37%-UNO 69,952

Total Estimate Costs	\$249,979
----------------------	-----------

WCD

- (b) Items, if any, significant to the performance of this contract, but excluded from computations of support cost and from considerations in proportioning costs:

Marvin D. Gosnold, Jr., Principal Investigator - Salary \$12,000

Duane A. Eversoll, Principal Investigator - Salary $\frac{14,000}{\$26,000}$

Article A-III - FUNDING

20.0.10
The total estimated cost of items under A-II (a) above, for the contract period stated in this Appendix A3 is \$249,979; DOE will pay 100% of the actual cost of these items incurred during the contract period stated in this Appendix A3, subject to the provisions of Article III and Article B-V. The estimated DOE support cost for the contract period stated in this Appendix A3 is \$249,979.

The estimated DOE support cost is funded as follows:

- (a) Estimated unexpended balance from prior period(s) \$ -0-
(b) New funds for the current period. \$249,979

Article A-IV - ADMINISTRATION AND REPORTS

- (a) Principal Investigators - Dr. William D. Gosnold, Jr.
Department of Geography - Geology
University of Nebraska - Omaha
Omaha, Nebraska
- Dr. Duane A. Everall
Nebraska Geological Survey
Conservation and Survey Division
University of Nebraska - Lincoln
Lincoln, Nebraska 68588
- Technical Administrator - Mr. Michael K. Tucker
DOE-Idaho Operations Office
Energy and Technology Division
550 Second Street
Idaho Falls, Idaho 83401
Telephone (208) 526-3180

The Principal Investigators shall be responsible for directing the work within the scope of Article A-I above, and as outlined in discussions and in periodic letters from the Technical Administrator.

- (b) The Principal Investigators shall prepare and submit reports in accordance with the attached Reporting Requirements Checklist.

U. S. DEPARTMENT OF ENERGY

REPORTING REQUIREMENTS CHECKLIST

DOE Form CR-537
(1-78)

(See Instructions on Reverse)

FORM APPROVED
OMB NO. 38R-0190

1. IDENTIFICATION University of Nebraska		2. OBLIGATION INSTRUMENT: DE-AS07-79ET27205. Modification No. A003											
3. REPORTING REQUIREMENTS													
A. PROJECT MANAGEMENT 1. <input type="checkbox"/> Management Plan 2. <input type="checkbox"/> Milestone Schedule & Status Report 3. <input type="checkbox"/> Cost Plan 4. <input type="checkbox"/> Manpower Plan 5. <input checked="" type="checkbox"/> Contract Management Summary Report 6. <input checked="" type="checkbox"/> Project Status Report 7. <input type="checkbox"/> Cost Management Report 8. <input type="checkbox"/> Manpower Management Report 9. <input type="checkbox"/> Conference Record 10. <input type="checkbox"/> Hot Line Report	Frequency M M	B. TECHNICAL INFORMATION REPORTING 1. <input checked="" type="checkbox"/> Notice of Energy RD&D Project (SSIE) 2. <input type="checkbox"/> Technical Progress Report 3. <input checked="" type="checkbox"/> Topical Report 4. <input checked="" type="checkbox"/> Final Technical Report C. PMS/MINI-PMS 1. Cost Performance Report <input type="checkbox"/> Format 1 WBS <input type="checkbox"/> Format 2 Functional <input type="checkbox"/> Format 3 Baseline <input type="checkbox"/> Format 5 Problem Analysis 2. <input type="checkbox"/> Cost/Schedule Status Report 3. <input type="checkbox"/> Management Control System Description 4. <input type="checkbox"/> Summary System Description 5. <input type="checkbox"/> WBS Dictionary	Frequency 0 A F										
FREQUENCY CODES: <table style="width:100%; border: none;"> <tr> <td style="width:50%;">A - As Required</td> <td style="width:50%;">Q - Quarterly</td> </tr> <tr> <td>C - Contract Change</td> <td>S - Semi-Annually</td> </tr> <tr> <td>F - Final (End of Contract)</td> <td>X - Mandatory for Delivery with Proposals/Bid</td> </tr> <tr> <td>M - Monthly</td> <td>Y - Yearly or Upon Contract Renewal</td> </tr> <tr> <td>O - One Time (Soon After Contract Award)</td> <td></td> </tr> </table>				A - As Required	Q - Quarterly	C - Contract Change	S - Semi-Annually	F - Final (End of Contract)	X - Mandatory for Delivery with Proposals/Bid	M - Monthly	Y - Yearly or Upon Contract Renewal	O - One Time (Soon After Contract Award)	
A - As Required	Q - Quarterly												
C - Contract Change	S - Semi-Annually												
F - Final (End of Contract)	X - Mandatory for Delivery with Proposals/Bid												
M - Monthly	Y - Yearly or Upon Contract Renewal												
O - One Time (Soon After Contract Award)													
4. SPECIAL INSTRUCTIONS A.5., A.6. - This report is due within 15 days after the end of the reporting period. B.3.- Due as agreed with Technical Administrator. B.4.- Submit 2 copies in draft forty-five days prior to completion date of contract term. After DOE approval is received, submit eleven copies including one camera-ready copy.													
5. ATTACHED HEREWITH: <table style="width:100%; border: none;"> <tr> <td style="width:50%;"><input checked="" type="checkbox"/> Report Distribution List</td> <td style="width:50%;"><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> WBS/Reporting Category</td> <td><input type="checkbox"/></td> </tr> </table>				<input checked="" type="checkbox"/> Report Distribution List	<input type="checkbox"/>	<input type="checkbox"/> WBS/Reporting Category	<input type="checkbox"/>						
<input checked="" type="checkbox"/> Report Distribution List	<input type="checkbox"/>												
<input type="checkbox"/> WBS/Reporting Category	<input type="checkbox"/>												
6. PREPARED BY (Signature and date):		7. REVIEWED BY (Signature and date):											



ID F-129 (Rev. 08-79)
 Ref. DOE 13302
 Use with DOE CR-537

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

Contract No.	Report Types													
	Milestone Schedule & Status Report Management Plan	Contract Management & Status Report	Manpower Summary Report	Cost Management Report	Project Status Report	Manpower Management Report	Conference Report	Notice of Energy RD&D Project	Hot Line Report	Technical Progress Report (SSIE)	Final Technical Report	Cost Performance Report	Summary System Description	WBS Dictionary
DE-AS07-79ET27205 Mod. No. A003														
Addressees	Number of Report Copies													
U. S. Department of Energy Idaho Operations Office 550 Second Street Idaho Falls, Idaho 83401														
Attn: M. A. Widmayer Energy & Technology Division					5	5						5	5	
Attn: Nell W. Fraser, Director Contracts Management Division					1	1				1		1	1	
Attn: E. G. Jones, Director Financial Management Division					1	1								
Technical Information Center P. O. Box 62 Oak Ridge, TN 37830											1			
U. S. Department of Energy Division of Geothermal Energy MS 3344 Federal Building, 12th & Penn., NW Washington, D. C. 20461 Attn: Bob Gray					1	1						1	1	
Duncan Foley UURI, 420 Chipeta Way Suite 12 Salt Lake City, Utah 84108					1	1						1	1	
Special Instructions														

UNIVERSITY OF UTAH RESEARCH INSTITUTE

UURI

EARTH SCIENCE LABORATORY
420 CHIPETA WAY, SUITE 120
SALT LAKE CITY, UTAH 84108
TELEPHONE 801-581-5283

April 14, 1982

Dr. William D. Gosnold
Dept. of Geography-Geology
University of Nebraska
Omaha, NE 68132

Re: Completion Date and Deliverables: DOE Contract DE-FC07-79ET27034

Dear Will:

I wish to personally thank you for attending the Roundup Conference and your valuable contribution to the success of this meeting. I'm sorry we didn't get a chance to review your contract with you during the meeting . . . we just plain ran out of time. With respect to your conference paper and bibliography, please make every effort to get these to me, camera ready, by April 30th. My goal is to have the proceedings edited and published by July 1, 1982.

During the course of the conference, contract reviews were conducted by Susan Prestwich and the state teams, with special emphasis on the status of various deliverables as stipulated in each contract. To assist in this review, I prepared summaries of each contract, listing modifications, tasks, deliverables (where such were specifically delineated) and contract completion dates. When I could find copies of reports, etc. in E.S.L. files, I indicated this on the summaries. I made no attempt to ascertain if monthly and quarterly reports had been issued as required by most contracts.

You will find enclosed a copy of the summary I prepared for your contract with notations of some deliverables that have been received and are on file at ESL. Please review this summary and let us know of any errors or omissions. Also, please indicate when you expect to finish each task and publish reports corresponding to the tasks or specific deliverables. This work is necessary so that DOE-Idaho can accurately close out each contract and assure adherence to contract requirements. If any tasks, time extensions or deliverables have been changed by verbal or letter agreements, not covered in formal modifications, it will be important for you to provide details of such changes to Susan Prestwich or me as soon as possible.

I note in your contract a termination date of March 31, 1983. I expect all work and deliverables will have been completed by that date.

Please do not hesitate to call me on (801) 581-5414 if you have any questions.

Best regards,

Carl A. Ruscetta
Technical Program Coordinator

encl.

cc. S. Prestwich
Idaho Falls, ID.

STATE: Nebraska
 ORGANIZATION: U. of Nebraska PHONE: 402-554-2457
 PRINCIPAL INVESTIGATOR/CONTACT: William Gosnold/Duane Eversoll (472-3471)
 NB Geol. Survey
 CONTRACT NO.: DE-AS07-79ET27205 DATE: 4/1/79
 EST. COMPLETION: 3/31/81 ORIGINAL AMOUNT OBLIGATED DOE: \$161,843
 CONTRACTOR: 17,000
 TOTAL: \$178,843

MODIFICATIONS:

NUMBER	DATE	DESCRIPTION	AMOUNT	
			DOE	CONTRACTOR
001	6/26/80	Increase Funding (Note: Page 2 of Mod 001 could not be found)	\$ 84,603	-
002	3/31/81	N.C.T.E. to 4/21/81		
003	9/21/81	Add Tasks: T.E. to 3/31/83 Increase Funds	\$249,969	26,000

DELIVERABLE STATUS:

TASK NO.	DESCRIPTION	DATE DUE	RECEIVED
1/Mod 0:	Establish temp. data bank - 13,000 O & G wells	3/31/81	
	Collect info. on aquifer temp. and water quality from files.		
2/Mod 0:	Drill 30-150m Th. Grad. Holes. Run geophys. logs and analyze borehole cuttings.	3/31/81	
3/Mod 0:	Prepare maps and cross-sections to display data	3/31/81	
4/Mod 0:	Reports per DOE requirements.		
1/Mod 3:	Complete BHT survey. Produce BHT Map 1:500,000	3/31/83	
2/Mod 3:	Continue HT Flow/Temp. Grad. Survey. Summary Interpretation.	3/31/83	
3/Mod 3:	Generate Computer Programs define data relationships.	3/31/83	
4/Mod 3:	Gravity Map of NB: 1:500,000 Scale: 5 miligal contour.	3/31/83	
5/Mod 3:	Compile all Geoscience Data by 4 Substate Regions	3/31/83	
6/Mod 3:	Outreach: Data to Users. Coop. w/EG&G, NMEI, UURI.	3/31/83	
7/Mod 3:	Compile and Publish Geoth. User Map. NOAA assist.	3/31/83	
8/Mod 3:	Reports Per DOE Form 537.		
(Cont'd on P. 2)			
	CONTRACT COMPLETION DATE:		
	TOTAL FUNDS EXPENDED DOE:		
	CONTRACTOR:		
	TOTAL:		

