



GL02956

United States Department of the Interior



GEOLOGICAL SURVEY

Geothermal Studies Project
2255 North Gemini Drive
Flagstaff, Arizona 86001

PHONE 001 602 556 7226

FAX 001 602 556 7169

MESSAGE FROM JOHN SASS

TO: Patrick Muffler

DATE: January 5 1993

MESSAGE: RE: Chronology of "Nutrioso Affair"

• May 1991: Phone call from **Ray Wallace** to **Sass** saying that a Springerville group headed by **Harris Crosby** (a local realtor) had succeeded in having money put into DOE's budget for a "Hot Dry Rock" test near Nutrioso. One of their lobbyists was **Stuart Udall**. I didn't write down the numbers but my recollection was that the appropriation was about \$175K to be matched by the state of Arizona's "Petroleum Overpayment Fund" or the like. Ray suggested to **Al Jelacic** that he get in touch with me to discuss adding on some science to what appeared to be blatant lard-encrusted pork.

• Late May, 1991: Phone call from **Al Jelacic** in which he asked me to join him, **Gladys Hooper**, **Dave Duchane** and **Ed Kaufman** (retired from LANL/HDR) together with a bit player named **Niles Lackey** (what a name!) from DOE's Albuquerque office to inspect the proposed site which, coincidentally enough was on some prime real estate owned by Mr. **Crosby**. The site has a million dollar view of the Nutrioso Valley (pictures to follow) and is almost ripe for development, lacking only a source of potable water, which at that locality is found in the Coconino Sandstone aquifer at a depth of about 2000'.

- June 2-6 1991: attended a workshop on Long Valley. Joined **Jelacic, Hooper, Duchane** and **Lackey**, and, accompanied by **Maureen Sass**, drove from Albuquerque to the Nutrioso Valley in East Central AZ (see accompanying map). Inspected the site and discussed parameters of scientific work that could be undertaken by the USGS. This discussion was carried out under the impression that the whole project was a done deal (the position taken explicitly by all DOE and local folks) and that the operator was **Navopache Electric Cooperative**, whose technical representative was **Ed Kaufman**.
- June 14 1991: Letter from Kaufmann to Sass asking for a formal commitment from USGS to perform heat flow and related measurements.
- June 24, 1991: letter from Sass to Kaufman formally committing USGS and suggesting a science plan.
- Remainder of 1991-spring 1992: Ball is in State of Arizona's court. The state decides it can't justify a sole source, and hires John Crawford (formally of DOE/SAN) to run the procurement.
- June 18, 1992: State of AZ issues RFP #A2-0095
- June 24, 1992: phone call, **Harris Crosby** to **Sass** asking for a copy of my letter of June 24, 1991 to **Ed Kaufman** to accompany Navopache's proposal (he and Kaufman had had a falling-out by this stage).
- ? • June 24, 1982: Letter, **Sass** to **Crosby** enclosing requested copy with a caution against representing our offer of scientific collaboration as being exclusively to his group.
- July 10, 1992: State of Arizona issues an amendment to RFP #A2-0095.
- July 15, 1992: Letter, **Sass** to AZ State Purchasing office clarifying USGS role.

- October 6, 1992: Letter from **Ed Kaufman** to **Sass** confirming that RFP# A2-0095 was withdrawn and asking for an update of USGS commitment to do science. ?
- November 10, 1992: State of Arizona issues IFP #A3-0041
- December 2, 1992: Repeat of **Kaufman's** request for an updated commitment.
- December 1-10, 1992: Phone conversations and conversations at AGU with prospective players, including **Ed Kaufman**, **Chandler Swanberg**, **Gene Suemnicht** (representing **Bechtel**) and **Jim Witcher** (approximate dates and times can be reconstructed from phone records and AGU program, if required).

December 11, 1992: Letter **Sass** to **Ed Kaufman** reaffirming USGS offer to collaborate scientifically with the **successful bidder**.

December 31, 1992: Phone call from **Gene Suemnicht** to **Sass** regarding deadlines for field and lab work contained in IFP #A3-0041 and requesting a letter to enclose with proposal.

December 31, 1992: Letter from **Sass** to AZ State Procurement Office setting forth USGS position on deadlines and requesting distribution of letter to potential bidders. FC's sent to **Kaufman**, **Suemnicht**, and **Witcher**, cc to **Swanberg**.

EDWARD L. KAUFMAN
7030 Isleta Blvd S.W.
Albuquerque, New Mexico 87105
Phone (505) 873-3980

June 14, 1991

John H. Sass
Geothermal Studies Project
U.S. GEOLOGICAL SURVEY
2255 N. Gemini Drive
Flagstaff, AZ 86001

Dear John:

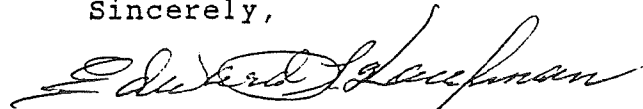
As you are aware, a potential power plant project is being planned for a site near the Village of Nutrioso, AZ. The intended purpose of the proposed project is to demonstrate the technical and economic viability of the hot dry rock technology developed, under DOE sponsorship, by the Los Alamos National Laboratory.

During our conversation at the site, on June 6, and again during our telephone conversation of June 13, you indicated that the Survey might be willing to provide a temperature sonde and truck for obtaining a stabilized bottom hole temperature in the Navopache Electric Cooperative #1 Escudilla Cattle Company test. The test will be located approximately 100' west of the east quarter corner of Sec. 30, Twp. 7 N, Rge 30 E, Apache County, AZ, and is planned to reach the basement at about 3,500 feet.

You further indicated that the Survey might be willing to obtain heat conductivity information from drill cuttings of the basement rock. These data would be helpful to both our programs, yours in terms of heat-flow, and ours in terms of prospect evaluation.

My understanding of our conversations is that the above data could be provided at no cost to the planned drilling effort, in return for the data. Would you please confirm the my understanding of our discussions?

Sincerely,



Edward L. Kaufman

Geothermal Studies Project
2255 North Gemini Drive
Flagstaff, Arizona 86001

June 24, 1991

Edward L. Kaufman
7030 Isleta Blvd SW,
Albuquerque NM 87105

Dear Ed:

Thanks for your letter of June 14, 1991. We are pleased to have the opportunity of conducting temperature measurements in the Navopache Electric Cooperative #1 Escudilla Cattle Company Test Well. As I understand it, production tubing will be run to total depth and filled with water upon completion of the well. The well will then be left standing idle for a period of about 30 days prior to setting plugs and emplacing a submersible pump in slotted casing within the Coconino Sandstone aquifer.

Our schedule for the summer and early fall is quite busy, but we attach a high priority to obtaining temperature measurements in such a deep well in southeastern Arizona. Our operational plan is to obtain our first temperature log as soon as possible after the tubing is run. Thereafter, we plan on obtaining additional logs at intervals of approximately 1, 5, 10, and 20 days after the initial log, and a final log just before the plugging and completion phase. While we are logging, you, as the representative of the operator, are most welcome to witness the logging operations and to examine field copies of the data. Hard copies of the temperature profiles and our initial interpretation will be available to you and other interested parties as a USGS Open File Report as soon after logging as is possible. Our logging operation will be financed entirely by the Geothermal Resources Program of the USGS; that is, at no cost to you, the operator, the Department of Energy, or the State of Arizona.

We would appreciate being kept up-to-date on the drilling, logging and testing schedule. As I said, our dance card is getting pretty full, and we may have to work around some other commitments, depending on when the hole is actually available. Assuming that a useful series of temperature profiles is obtained, we will want to obtain samples of drill cuttings (initially, about one every 50') for measurements of thermal conductivity. In this connection, if you could ask the mud-loggers to save somewhat larger washed samples than is customary (say about 100 grams) this would be very helpful to our conductivity studies and to other, related scientific studies. Also, if crystalline basement is encountered as indicated in your well-plan, we would like to get as much of that material as possible (several kg would be nice) to measure its radiogenic heat production.

We would also like to obtain copies of any other geophysical logs obtained in connection with this project. Porosity and density logs will be particularly important to obtaining estimates of the formation thermal conductivity.

We appreciate your willingness to collaborate with us in obtaining thermal data from this well, and we look forward to working with you later this summer.

Yours Sincerely,

John H. Sass
Geophysicist

cc Gladys Hooper
Peter Lipman

Geothermal Studies Project
2255 North Gemini Drive
Flagstaff, Arizona 86001

June 24, 1992

Mr. Harris Crosby
1216 S Doran St.
Mesa AZ 85204

Dear Mr Crosby:

To follow up our telephone conversation of today, I am enclosing a copy of a letter that I sent to Ed Kaufman exactly a year ago, confirming a verbal proposal to conduct temperature measurements in the Navopache Electric Cooperative #1 Escudilla Company Test Well. The letter also proposes that the Geothermal Studies Project, Branch of Tectonophysics, U.S. Geological Survey perform thermal conductivity determinations on samples of core and drill cuttings from the Test Well. The aim of our proposed research is to produce an equilibrium temperature profile reflecting actual formation temperatures as a function of depth, and to determine the heat flow from the well.

As I said in our telephone conversation, it would be appropriate to include the enclosed letter as an attachment to your response to the RFP **provided that no representation is made that our proposal is made excusively to your group.** In the event that the award for drilling the well is made to a competing bidder, we would attempt to negotiate access to the well for temperature logs and to obtain rock samples from the successful bidder in exactly the same fashion as outlined in the enclosed letter. The original letter to Mr. Kaufman was based on the assumption that the operator had already been chosen by DOE and the State of Arizona, and that Mr. Kaufman was the technical representative of the operator. I would therefore ask that, if you do include my original letter to Mr. Kaufman with your proposal, you include this letter as well.

Yours Sincerely,

John H. Sass
Geophysicist

cc Gladys Hooper
Al Jelacic
Ed Kaufman
Peter Lipman
Carl Mortensen



SOLICITATION AMENDMENT

STATE PURCHASING OFFICE

1688 W. ADAMS, RM 220
PHOENIX, ARIZONA 85007-2687
(602) 542-5511

Solicitation No. **A2-0095** Amendment No. **ONE (1)** Page **1** of **3**

Solicitation Due Date: **AUGUST 3, 1992** 3:00 P.M. MST

A signed copy of this amendment must be received by the State Purchasing Office prior to the Solicitation due date and time. This Solicitation is amended as follows:

AMENDMENT NUMBER ONE TO REQUEST FOR PROPOSAL A2-0095

NUTRIOSO GEOTHERMAL PROJECT

As a result of the Pre-Proposal conference conducted on June 30, 1992, the following information is hereby encompassed within the aforementioned RFP in order to allow all offerors the opportunity to submit competitive proposals.

1. The Official Proposal Due Date and Time is hereby extended until AUGUST 3, 1992, 3:00 P.M., MST.
2. For informational purposes only, the State of Arizona has determined through the United States Department of the Interior, Geological Survey, Geothermal Studies Project, that the Escudilla Management Corporation, Springerville, Arizona, has approximately one thousand (1,000) acres available for potential usage as drill sites (formerly approved by the United States Department of Energy). The Corporation has advised the State of Arizona they are willing to provide free access to and from the site, as well as, use of water and other assistance as may be necessary to operate within or on the site location.
3. The following brochures are currently available in the State Procurement Office and can be reviewed Monday thru Friday, from 9:00 A.M. to 3:00 P.M. (1) Los Alamos "Hot Dry Rock Geothermal Energy - A New Energy Agenda for the 21st Century". (2) Massachusetts Institute of Technology, Energy Laboratory, "Economic Predications for Heat Mining: A Review and Analysis of Hot Dry Rock (HDR) Geothermal Energy Technology, July 1990". No appointment is necessary to review documentation.
4. Page 6, Paragraph 1.2.2, after the word "analysis", insert a period and eliminate "for parameters specified in this section".
5. Page 6, Paragraph 2.1, omit in its entirety and substitute with the following:

All other provisions of the Solicitation shall remain in their entirety.

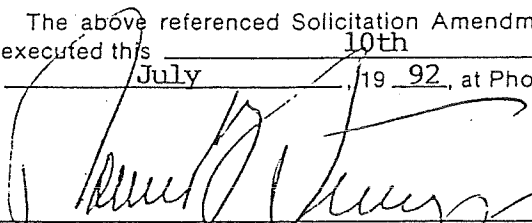
Vendor hereby acknowledges receipt and understanding of above amendment.

The above referenced Solicitation Amendment is hereby executed this 10th Day of July, 19 92, at Phoenix, Arizona.

Signature _____ Date _____

Typed Name and Title _____

Name of Company _____


ROBERT E. STEPHENSON, JR. C.P.P.O.
ADMINISTRATOR, PROFESSIONAL SERVICES UNIT



SOLICITATION AMENDMENT

STATE PURCHASING OFFICE

1688 W. ADAMS, RM 22C
PHOENIX, ARIZONA 85007-2687
(602) 542-5511

Solicitation No A2-0095 Amendment No ONE (1) Page 2 of 3

Solicitation Due Date AUGUST 3, 1992 3:00 P.M. MST

A signed copy of this amendment must be received by the State Purchasing Office prior to the Solicitation due date and time. This Solicitation is amended as follows:

"The contractor shall, at an authorized site in the Alpine Springerville area, drill an exploratory hole to a sufficient depth to accurately ascertain the viability of the site as a geothermal source (hot dry rock geothermal, etc.) which should include a minimum of 30.5m or 100 feet into the granitic basement, if encountered".

6. Page 7, Paragraph 2.3.1, omit in its entirety and substitute with the following:

"The contractor shall explain the availability of the site, its geologic favorability and environmental acceptability; the existence of, or the need to obtain licenses, permits, approvals for site occupation and utilization (i.e., drilling, etc.). The site may be on public or private lands".

7. Page 7, add the following as Paragraph 2.3.2

"The contractor shall obtain all necessary Federal, State, Local and private authorizations prior to implementation of this task. This includes the fulfillment of all requirements in Title 12, Chapter 7, Article 2 Geothermal Resources of the Arizona Administrative Code (A.A.C.) which is available from the Secretary of State and administered by the Arizona Geological Survey.

8. Page 9, Paragraph 3.6, add the following to the beginning of the original sentence.

"In addition to the sample requirements in A.A.C. R12-7-220, sufficient sample material..."

9. Page 12, Paragraph 6.2, after the word "acceptable" first line of the paragraph, add, "to both parties a"...

10. Page 12, Paragraph 6.5.1, omit in its entirety and substitute with the following:

"The State Agency shall have full access and reproduction rights to all materials generated as a result of this study".



SOLICITATION AMENDMENT

STATE PURCHASING OFFICE

1688 W. ADAMS, RM 220
PHOENIX, ARIZONA 85007-2687
(602) 542-5511

Solicitation No A2-0095 Amendment No ONE (1) Page 3 of 3

Solicitation Due Date AUGUST 3, 1992 3:00 P.M. MST

A signed copy of this amendment must be received by the State Purchasing Office prior to the Solicitation due date and time. This Solicitation is amended as follows:

11. Page 14, Paragraph 7.1, omit in its entirety and substitute with the following:

"Within 180 days of contract award, the contractor shall have completed all the Field Work task elements".

12. Page 15, Paragraph 7.2, omit in its entirety and substitute with the following:

"Within 180 days of contract award, the contractor must have completed all the Laboratory Work task elements".

13. Page 18, Paragraph 9.5 (a.), omit 20% and replace with "10%"

14. The Study is defined as the "Nutrioso Geothermal Project". However, after further review by the State Agency it has been determined that the official designation of the project should read as follows:

"ALPINE SPRINGERVILLE AREA GEOTHERMAL PROJECT"

Geothermal Studies Project
2255 North Gemini Drive
Flagstaff, Arizona 86001

July 15, 1992

Robert E. Stevenson, Jr.
Administrator, Professional Services Unit
State Purchasing Office
1688 W Adams Rm 220
Phoenix, AZ 85007-2687

Dear Mr. Stephenson:

Thank you for sending me Amendment #1 to Solicitation A2-0095, Nutrioso Geothermal Project. I am puzzled by paragraph 2 of the subject amendment, which identifies my project as the source of information on the land status.

I should like to emphasize that neither the U.S. Geological Survey nor the Geothermal Studies Project, nor I personally have any knowledge of or interest in the status of the land associated with what is now known as the Alpine Springerville Area Geothermal Project (Amendment 1, Paragraph 14). The interest of the U.S. Geological Survey is strictly limited to certain scientific studies in the borehole and on material obtained from the borehole, as outlined in the enclosed correspondence.

I hope that this letter clears up any potential misunderstandings over our role in the project.

Yours Sincerely,

John H. Sass
Chief
Geothermal Studies Project

cc Gladys Hooper
Peter Lipman
Carl Mortensen

GEOHERMAL SYSTEMS CORPORATION

October 6, 1992

John H. Sass
Geothermal Studies Project
U.S. GEOLOGICAL SURVEY
2255 N. Gemini Drive
Flagstaff, AZ 86001

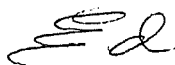
Dear John:

Frank Mancini, Arizona Energy Office, confirmed the rumor that RFP #A2-0095 is being withdrawn, and that a new RFP will be forthcoming in between two and three weeks. A targeted drilling date of April 1, 1993 is expected (hope the date is NOT significant). I will let you know when I receive a copy with the hope that our previous arrangement will still stand, and that you will write an update letter for inclusion in the proposal.

Even though the last RFP did not address the hypothesis approach, and I am not sure the next one will either, I am planning to include your rationale, and regression analysis as the basis for decision in the proposal to be submitted.

To assure your temperature probe easily reaches the bottom and does not get snagged upon withdrawal, I am planning to temporarily hang pipe to total depth - therefore my question - what is the outside diameter of the probe?

Sincerely,



Edward L. Kaufman

~~Sincerely,~~ ECPs

Geothermal Studies Project
2255 North Gemini Drive
Flagstaff, Arizona 86001

December 11, 1992

Ed Kaufman
Geothermal Systems Corporation
7030 Isleta Blvd. SW
Albuquerque, NM 87105

Dear Ed:

Thanks for your letter of December 2 and your earlier letter. I'm sorry to be so long getting back to you, but I've been on the road almost non-stop since the end of October (I'm composing this in a hotel room in San Francisco).

Let me assure you that, should you be the successful bidder for RFP #A3-0041, the proposal that I made in 1991 will still stand; that is, The Geothermal Studies Project, U.S. Geological Survey will measure temperature profiles in the exploratory well over the time period following drilling (a minimum of 30 days) that the well is available with a string of water-filled tubing to total depth and will estimate an equilibrium temperature profile based on those measurements. We shall also perform thermal-conductivity determinations from drill cuttings and any cores that are made available, and measure the abundances of the heat producing elements on drill cuttings or core from the basement rocks. This research will be funded through the Geothermal Investigations Program of the USGS.

I should add that we shall propose the same series of measurements to the successful bidder on the subject RFP in the event that your proposal is not accepted.

Yours Sincerely,

John H. Sass
Chief, Geothermal Studies

cc Gladys Hooper
Peter Lipman

Geothermal Studies Project
2255 North Gemini Drive
Flagstaff, Arizona 86001

December 31, 1992

Robert E. Stephenson, Jr.
State Procurement Office
1700 W. Washington
Phoenix, AZ, 85007

Dear Mr. Stephenson:

RE: Solicitation # A3-0041

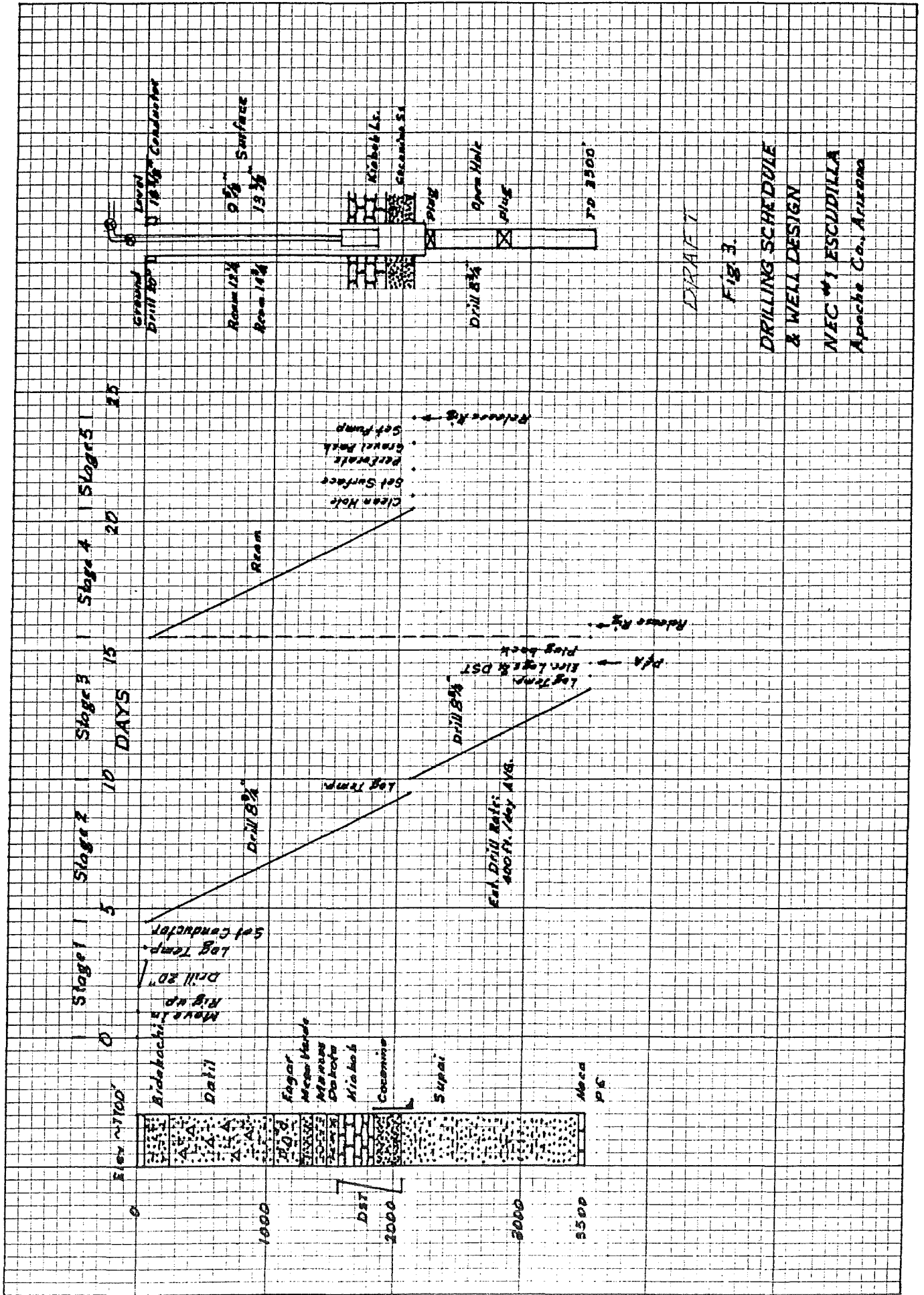
Attached is a copy of a letter that I sent to Ed Kaufman at his request. As I state in the letter, I intend to offer to the successful bidder, the scientific collaboration of the USGS in obtaining and interpreting thermal conductivity, temperature and radiogenic heat production data. One potential bidder raised the issue of deadlines contained in the project timetable (Item 7, p13 of 58). While we intend to make a good-faith effort to accomodate the schedule of the operator, we have other obligations and cannot guarantee that our participation will conform to the timetable set forth in the solicitation.

You may wish to inform potential bidders of our position on this matter.

Yours sincerely,

John H. Sass

FC Ed Kaufman
Gene Suemnicht
Jim Witcher
cc Chan Swanberg



DRAFT
 FIG. 3
 DRILLING SCHEDULE
 & WELL DESIGN
 NEC WY ESCUDILLA
 Apache Co., Arizona

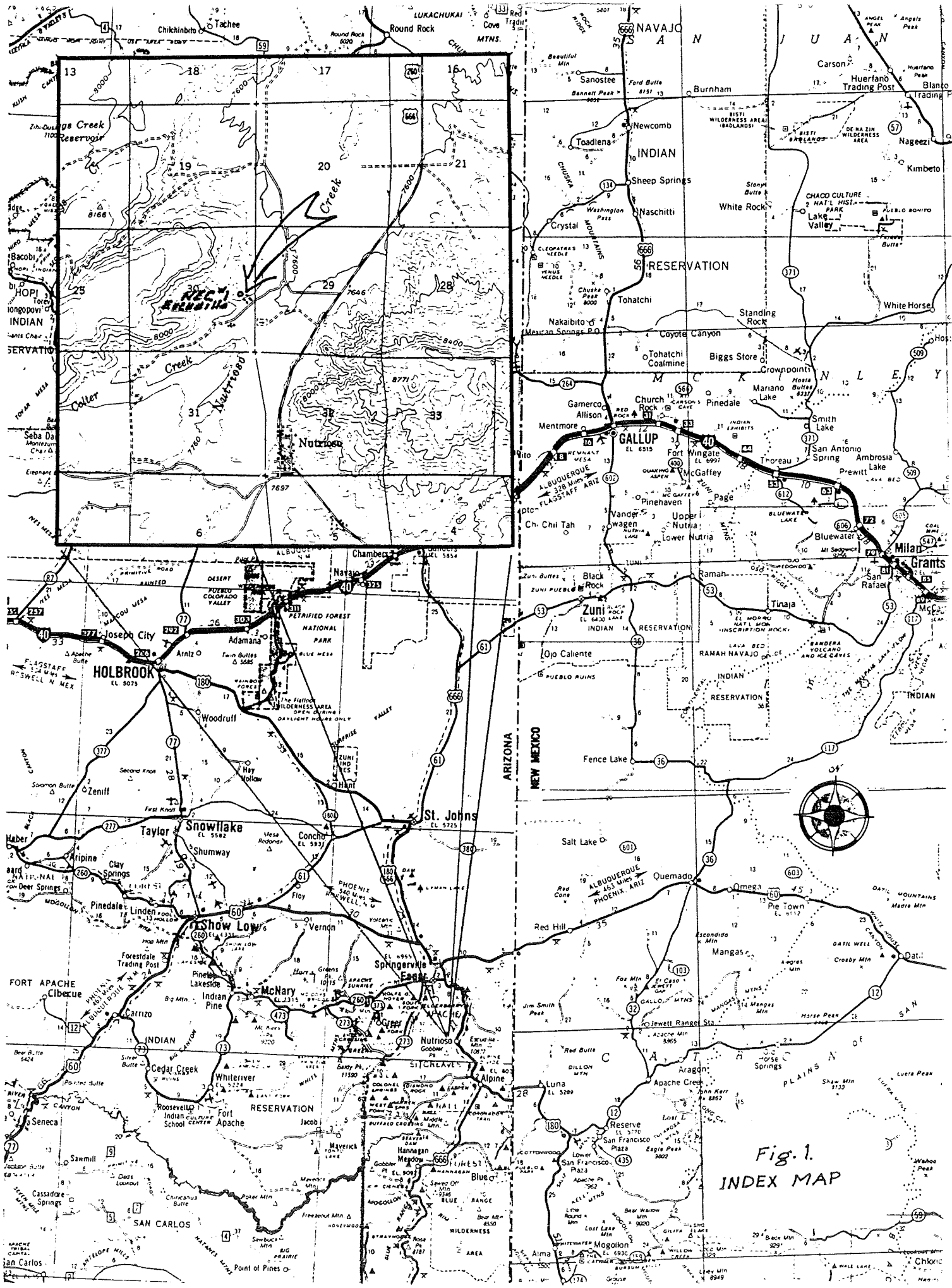


Fig. 1.
INDEX MAP