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TECHNICAL ASSISTANCE AND INFORMATION DISSEMINATION
EFFORTS AT THE IDAHO NATIONAL ENGINEERING LABORATORY;
OCTOBER 1, 1979 TO SEPTEMBER 30, 1980

W.J. Toth
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ABSTRACT

This report describes technical assistance and information dissemination performed by EG&G Idaho's Hydrothermal Commercialization Division (now Geothermal Program Office) at the INEL during FY-80. Requests for technical information increased by one-third over the previous year, and tended to be more specific than previously. Requests for technical assistance generally involved larger projects than previously, and preparation of adequate responses required significantly more time. Information dissemination included 18 exhibits in 10 states plus the District of Columbia, with nearly 400,000 exposures. The work included development and production of major display hardware; preparation and production of a new edition of Rules of Thumb, a much-demanded brochure; and support of State Commercialization Teams by production of customized slide shows for 10 states plus additional support through bulk distribution of brochures and technical documentation on request.

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TECHNICAL ASSISTANCE AND INFORMATION DISSEMINATION EFFORTS
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INTRODUCTION

In a program funded by the Department of Energy, the Idaho National Engineering Laboratory (INEL), which is managed by EG&G Idaho, Inc., provides technical information and assistance to parties interested in the direct applications of geothermal energy. Information is provided to the public, private, and technical sectors through exhibits and presentations at conferences and meetings and through the distribution of pamphlets, brochures, and fact sheets at these meetings or to other requesters.

Technical assistance is provided free of charge to requesters in the Rocky Mountain Basin and Range Region either through in-house engineering or through subcontracts to private engineering firms. Up to 100 man-hours of effort are provided to requesters on a first-come, staff-available basis. The State Commercialization Teams participate in technical assistance by handling initial requests, answering those for which they have information, and forwarding the remainder to INEL for engineering assistance. Through assisting requesters with technical information and initial feasibility studies, potential geothermal users are encouraged to further explore the development of hydrothermal resources and thus eventually to supplant their use of conventional energy.

BACKGROUND

The Technical Assistance Program provides up to 100 man-hours of effort for preliminary economic and technical feasibility assessment of geothermal direct use projects. Such uses include space conditioning; district heating; food and other agricultural product production, processing, or drying; aquaculture; roadway deicing; ethanol production; and other processes which can effectively utilize heat extracted from geothermal resources. Assistance, in a consulting format, is customarily provided for projects in the Rocky Mountain Basin and Range (RMBR) region,

specifically in the states of Colorado, Idaho, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming. Consultation can relate to conceptualization; engineering; economics; water chemistry implications for environmental, disposal, and material selection considerations; and planning and development strategies. Technical information is also provided under the program. Projects outside the RMBR region and those involving significant electrical power generation or requiring geothermal resource evaluation or characterization may receive assistance through other DOE programs or contractors. As such cases arise, appropriate referrals are made.

Assistance is directed to providing potential geothermal energy developers/users with sufficient confidence to engage competent private consulting and engineering services for project development. Competition with private sector consultants or engineering firms is not intended, so detailed engineering design, drafting, specifications, and proposal preparation are not provided under the program.

Information dissemination activities include development and placement of exhibit and audio-visual materials, brochure preparation and distribution, and providing cognizant technical staff to discuss geothermal applications and implications at conferences, exhibitions, and public meetings.

TECHNICAL ASSISTANCE

During FY-80, the volume of requests for information and technical assistance continued the dramatic growth shown in earlier reporting periods. Requests for technical information and documentation increased by one-third from the previous year and many were more specific than in the past. Technical assistance requests tended to be more detailed and to involve larger projects than before. During the first half of the fiscal year, the number of requests for technical assistance was more than one-third higher than in previous years. The number of requests during the last six months of the year decreased to about half the number received during the first six months, so the year-end total was effectively the same

as in FY-79. The lower number of requests received during the last half of the year was due to the increased expertise and increased activity on the part of the State Commercialization Teams. Increased activity and interest in this program is indicated in Table 1. (See Appendix A for project listing.)

TABLE 1. USER ASSISTANCE PROGRAM ACTIVITY SUMMARY, JANUARY 1977 TO OCTOBER 1980

<u>Fiscal Year</u>	<u>Requests for Information</u>	<u>Requests for Technical Assistance</u>
77	24	10
78	131	33
79	295	79
80	411 ^a	78 ^b

- a. Informational requests: 575 by 411 requesters in FY-80.
 b. Technical assistance requests: 83 by 78 requesters in FY-80.

Increased state team efforts in information dissemination, site-specific studies, listing of interested and competent private-sector consultants and architectural engineering firms for referral, and in some cases, technical assistance were responsible for reducing the number of requests forwarded to EG&G for technical assistance. The resulting increased proportion of technical assistance requests for larger, more complex projects has increased the workload so that the year-end carryover of outstanding assistance requests is about 30 compared to 20 at the end of FY-79. The carryover is about equally divided among requesters who have not provided sufficient data or information following an initial contact, technical assistance responses which are at various stages of completion, and requests which have not been addressed beyond the initial contact. Efforts are under way to reassess the interest of the nonresponsive group, to complete responses in progress, and to address the balance of requests in a timely fashion. Additional manpower is required to expedite these efforts and to provide a reasonable response time to new requests; this manpower is being obtained from the existing EG&G Idaho functional organization.

A limited number of technical assistance activities have been subcontracted to private sector engineering firms to promote development and utilization of private sector expertise and to accelerate development of geothermal direct heat projects. Seven subcontracts were issued to private firms in three states, covering projects that would use geothermal heat for space conditioning in senior citizens facilities, offices, commercial buildings, residences, a school, and a hospital. The use of geothermal heat for ethanol and methane production was also assessed under subcontracted assistance. Four of the subcontracts were completed, one was cancelled due to the death of a site owner and subsequent unavailability of the site for development, and two subcontracts will be completed in FY-81 following completion of geothermal well drilling and availability of site-specific resource information. Technical assistance efforts for FY-81 show a fourfold increase in technical assistance subcontracting over FY-80, with up to 24 subcontracts expected to be issued.

Projects receiving technical assistance are categorized as public, commercial, or private; private projects typically include single-family residences and small-scale developments by proprietorships or partnerships. The distribution of technical assistance requests, cost range, and average cost per response for FY-80 are shown in Table 2.

TABLE 2. DISTRIBUTION, COST RANGE, AND AVERAGE COST FOR FY-80 TECHNICAL ASSISTANCE

	Project Type		
	Public	Commercial	Private
Number of requests	18	28	32
Cost range of assistance	\$1000-\$5000	\$1000-\$5000	\$250-\$3000
Estimated average cost	\$2500	\$2500	\$1000

It is anticipated that overall average costs will rise as the proportion of public and commercial requests rise, since these requests

typically require more than twice as much time as private requests, and since the State Commercialization Teams are expected to answer a greater proportion of private requests.

The majority of projects receiving technical assistance have involved uses of conventional space heating technology, but increasing interest in water source heat pump technology for space conditioning, in district heating system development for new subdivisions, and in geothermal ethanol production has been noted throughout the year. Little interest in process heat applications has been expressed, probably due to strong expectation of marginal economics, incomplete utilization of energy conservation techniques, and the lack of knowledge or experience related to development and use of geothermal energy on the part of industrial energy users. An additional important factor is the small number of adequate, proven geothermal resources in close proximity to plants utilizing large amounts of process heat. Significant effort is required to overcome these obstacles, and FY-81 activities will be directed toward this end. (See Future Plans, page 6.)

Over the past several years, projects that are developed following receipt of technical assistance typically do not proceed into development or construction until about two years after receipt of the assistance. Generally, this still seems to be the case. The current economic situation, and the time required for permitting and obtaining attractive financing will probably continue to result in a time lag to development.

INFORMATION DISSEMINATION

The Information Dissemination function incorporated three specific subtasks:

1. Exhibition Operations. During FY-80 geothermal displays were placed at 19 conferences and expositions, and most displays were staffed by geothermal program personnel. In the process of conducting this work, significant achievements included:

- o Exhibit materials received more than 400,000 exposures in 9 states and the District of Columbia. (See Appendix B.)
 - o Exhibits were placed in shows sponsored by more than half a dozen energy-related groups and technical/professional societies. (See Appendix C.)
 - o Three major pieces of display hardware were fabricated during the year: two backwalls and an electronic computer-driven binary process power plant model.
2. Brochure Preparation. During FY-80, the Rules of Thumb brochure underwent a major revision. This brochure is a very popular and useful brochure, and is requested in large quantities. A format for a series of Geothermal Fact Sheets was developed, and the first three fact sheets were drafted. (These materials subsequently received DOE approval and are now available.)
3. State Team Support. Quantities of geothermal brochures and technical reports were furnished to State Commercialization Teams on request. A customized slide/sound show was prepared for each of the states in the Rocky Mountain Basin and Range Region (Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming); plus Arizona, Idaho, and Nevada. These shows, each approximately 12 minutes long, share a common "envelope" which surrounds a window that is unique for each state.

FUTURE PLANS

Technical Assistance

Technical assistance efforts will be expanded in FY-81, especially in the area of subcontracting to private consulting and engineering firms. This latter effort will help stimulate the development of geothermal utilization expertise in the private sector.

In addition to direct technical assistance, several additional efforts will be undertaken to stimulate interest in the development of interest and markets of geothermal energy. First, a community assistance effort is planned to provide information and spark interest in communities with geothermal district heating potential. Efforts will focus on assisting interested communities in identifying sources of private and governmental sources of financing and in applying for such financing.

In another effort, an industry advisory team is being organized to stimulate interest in the development and application of geothermal resources to specific industrial applications. In the initial phase, the food industry has been selected. Efforts will focus on presentations to both industrial groups and to individual industries, and then assisting interested, responsive companies in obtaining technical and financial assistance in their development efforts.

In yet another effort, workshops or short courses will be organized and presented to interested groups in the technical community. These groups might include technical and engineering professional societies or specific industrial groups such as the food industry mentioned above. Other organizations such as the Oregon Institute of Technology and the University of Utah Research Institute's Earth Science Laboratory will be asked to participate in these efforts to ensure the transfer of information and technology to the private sector.

Finally, INEL will provide assistance and support to a newly formed district heating product team, whose efforts will stimulate further interest in community district heating systems. Efforts will include participation in planning meetings, providing technical data and participation in general outreach activities.

Information Dissemination

Information dissemination efforts are being reduced in FY-81 to eight displays at conferences and meetings and the production of five fact sheets. In addition, some minor display improvements and a revision of the computer program display are planned.

APPENDIX A

TECHNICAL ASSISTANCE REQUESTS FY-80

TABLE A-1. TECHNICAL ASSISTANCE REQUESTS FY-80

<u>Site and Application by State^a</u>	<u>Initial Contact CY-79</u>	<u>Active TA File</u>	<u>Field or Office Meeting</u>	<u>Annual Heat Load (x 10⁹ Btu)^b</u>
<u>ARIZONA</u>				
Tucson. Space conditioning for IBM plant. Referred by DOE-ID. (Bob Sherry)	Yes	Closed	Yes	193.0
<u>COLORADO</u>				
Mt. Princeton Hot Springs. Residential space heating, pump problem evaluation. (A. Herzog)	Yes	Closed	No	0.1
Glenwood Springs. Space heating for 6-story office building. (P. Rosselle)	No	Closed	Yes	2.3
Glenwood Canyon. Highway deicing; test facility in operation. (H. Swanson, Colorado Highway Department)	Yes	Closed	Yes	Large
Minturn. Space heating for school. (J. Herriot)	Yes	Open	No	Large
Boulder Greenhouse. (G. Vranesh)	Yes	Closed	Yes	200.0

a. Requester(s) names(s) in parentheses.

b. Small = <10⁹ Btu/yr; large = >10⁹ Btu/yr.

TABLE A-1. (continued)

Site and Application by State ^a	Initial Contact CY-79	Active TA File	Field or Office Meeting	Annual Heat Load ($\times 10^9$ Btu) ^b
<u>IDAHO</u>				
Hells Canyon. Geothermal ethanol production using wood fiber. (G. Gillemot)	No	Closed	Yes	Large
Ketchum. Residential subdivision heating--200 homes. (M. Brown)	Yes	Open	No	24.0
Sun Valley. Environmental and engineering assessment for district heating. (S. Harris)	No	Open	Yes	260.0
Cascade. District heating. (T. Grossi)	Yes	Open	Yes	Large
Cascade. Space heating for school. (L. Miller)	No	Open	Yes	Large
Kuna. Geothermal methane/ethanol production. (B. Anderson) ^c	No	Closed	Yes	7.0
Malad. Space heating for school--well evaluation. (H. May, Supt.) ^c	Yes	Open	No	Large

- a. Requester(s) names(s) in parentheses.
- b. Small = $<10^9$ Btu/yr; large = $>10^9$ Btu/yr.
- c. TA subcontract issued for this project.

TABLE A-1. (continued)

<u>Site and Application by State^a</u>	<u>Initial Contact CY-79</u>	<u>Active TA File</u>	<u>Field or Office Meeting</u>	<u>Annual Heat Load (x 10⁹ Btu)^b</u>
<u>IDAHO (continued)</u>				
Coeur D'Alene. Water-source heat pump augmentation. (A. Fall)	Yes	Closed	No	0.2
Preston. Unspecified. (B. Stokes)	No	Open	No	Large
Rupert. Greenhouse. (M. Gardner)	Yes	Open	No	0.1
Twin Falls. Residential subdivision district heating. (D. Armstrong)	No	Closed	No	12.0
Twin Falls. Geothermal ethanol production. (F. Needham)	No	Closed	Yes	50.0
Kimberley. Space heating for greenhouse and research facilities. (C. Brockway)	No	Open	Yes	Large
Murtaugh. Residential space heating--heat pump system. (G. Meyers)	No	Closed	Yes	0.1
Givens Hot Springs. Residential subdivision district heating. (E. Marsh)	Yes	Closed	Yes	12.0
Hagerman. Aquaculture. (D. Davis)	No	Closed	Yes	Small

a. Requester(s) names(s) in parentheses.

b. Small = <10⁹ Btu/yr; large = >10⁹ Btu/yr.

TABLE A-1. (continued)

<u>Site and Application by State^a</u>	<u>Initial Contact CY-79</u>	<u>Active TA File</u>	<u>Field or Office Meeting</u>	<u>Annual Heat Load (x 10⁹ Btu)^b</u>
<u>IDAHO (continued)</u>				
Hagerman. District heating. (R. Depugh)	No	Closed	Yes	20.0
Bliss. UURI requests future well log at White Arrow Ranch.	No	Open	No	Large
Jerome. Aquaculture. (G. Funderberg)	Yes	Open	No	Small
Declo. Geothermal ethanol production. (G. Parr)	Yes	Closed	Yes	Large
Blackfoot. Potato processing. Note: requester involved in Madison PON; TA is for Blackfoot plant only. (J. Rainwater, AMPCO)	Yes	Closed	Yes	Large
Lava Hot Springs. Unspecified. (Joe Later)	Yes	Open	Yes	Small
Cobalt. Power for mine. (Blackbird Mines)	No	Closed	No	260.0
May. Residential and greenhouse heating. (N. Chaffee)	No	Closed	Yes	0.2
Challis. Residential district heating. (R. Lefevre, IECO)	Yes	Closed	Yes	20.0

a. Requester(s) names(s) in parentheses.

b. Small = <10⁹ Btu/yr; large = >10⁹ Btu/yr.

TABLE A-1. (continued)

<u>Site and Application by State^a</u>	<u>Initial Contact CY-79</u>	<u>Active TA File</u>	<u>Field or Office Meeting</u>	<u>Annual Heat Load (x 10⁹ Btu)^b</u>
<u>IDAHO (continued)</u>				
Challis. Space heating for school facilities. (T. Donicht)	No	Open	Yes	Large
Butte City. Greenhouse. (J. Richardson)	No	Open	Yes	0.2
Parma. Geothermal methane/ethanol production. (R. Obendorf) ^c	No	Open	Yes	7.0
Nampa. Space heating for hospital (A/E with geothermal experience has been retained). (E. Carlson)	No	Open	Yes	Large
Emmett. Geothermal ethanol production. (S. Clements, Roystone Hot Springs)	No	Open	Yes	Large
Boise. Space heating for hospital. (Elks Rehabilitation Hospital) ^b	Yes	Open	Yes	10.0
Weiser. Geothermal ethanol production. ^d (P. Gurley)	Yes	Open	Yes	Large

a. Requester(s) names(s) in parentheses.

b. Small = <10⁹ Btu/yr; large = >10⁹ Btu/yr.

c. TA subcontract issued for this project.

d. Owner deceased; site no longer available. TA subcontract issued for this project has been cancelled.

TABLE A-1. (continued)

<u>Site and Application by State^a</u>	<u>Initial Contact CY-79</u>	<u>Active TA File</u>	<u>Field or Office Meeting</u>	<u>Annual Heat Load (x 10⁹ Btu)^b</u>
<u>IDAHO (continued)</u>				
Weiser. Geothermal ethanol production (C. Jenkins)	No	Open	No	Large
Driggs. Greenhouse. (Mr. Bergeson)	Yes	Open	Yes	Small
Felt. Geothermal ethanol production. (D. Arnold)	No	Open	Yes	Large
<u>LOUISIANA</u>				
New Orleans. Geo-brine for sugar plant process heat; meeting at the request of DOE-ID. (L. Landry, J. Harrison)	No	Closed	Yes	400.0
<u>MONTANA</u>				
Barkell's Hot Springs. Greenhouse. (Dr. J. Miller)	No	Closed	Yes	Small
Hardin. Space heating retrofit of mine support buildings. (R. Guth)	Yes	Open	No	Large
Boulder. Greenhouse and aquaculture. (S. Levin)	No	Closed	Yes	Small

a. Requester(s) names(s) in parentheses.
 b. Small = <10⁹ Btu/yr; large = >10⁹ Btu/yr.

TABLE A-1. (continued)

Site and Application by State ^a	Initial Contact CY-79	Active TA File	Field or Office Meeting	Annual Heat Load (x 10 ⁹ Btu) ^b
<u>MONTANA (continued)</u>				
Warm Springs. Unspecified. (M. Morigan, Flathead Indian Reservation)	No	Open	No	Unknown
Lost Trail Hot Springs. Space heating for resort.	No	Open	Yes	3.0
Saco. Space heating for resort. (M. Matovich)	No	Open	No	Small
Spring Creek. District heating for a new town. (R. Reich)	No	Open	No	26.0
Ennis. Space heating for U.S. Fish and Wildlife Service buildings. (C. Olsen)	No	Open	No	1.3
White Sulphur Springs. Space heating for hospital. (E. Schyer)	Yes	Open	No	Small

a. Requester(s) name(s) in parentheses.
 b. Small = <10⁹ Btu/yr; large = >10⁹ Btu/yr.

TABLE A-1. (continued)

<u>Site and Application by State^a</u>	<u>Initial Contact CY-79</u>	<u>Active TA File</u>	<u>Field or Office Meeting</u>	<u>Annual Heat Load (x 10⁹ Btu)^b</u>
<u>NEVADA</u>				
Reno. Residential space heating. (A. Sakelaris)	Yes	Open	Yes	0.2
Reno. Residential space heating. Referred by DOE-ID. (J. Smith)	No	Open	No	0.2
<u>NEW MEXICO</u>				
Truth-or-Consequences. Space heating for senior citizens' center (reservoir engineering). (L. Chadurvedi) ^c	Yes	Open	Yes	0.2
Silver City. Geothermal ethanol production. Requester has retained private consultant. (M. Roberts)	Yes	Closed	Yes	Large
Dona Ana County. Geothermal ethanol production. (D. Ainsworth)	No	Closed	Yes	500.0
<u>NEW YORK</u>				
Albany. Evaluate heat pump economics; referred to JHU/APL. (B. Krakou)	No	Open	No	Not applicable

a. Requester(s) name(s) in parentheses.
 b. Small = <10⁹ Btu/yr; large = >10⁹ Btu/yr.
 c. TA subcontract issued for this project.

TABLE A-1. (continued)

<u>Site and Application by State^a</u>	<u>Initial Contact CY-79</u>	<u>Active TA File</u>	<u>Field or Office Meeting</u>	<u>Annual Heat Load (x 10⁹ Btu)^b</u>
<u>NORTH DAKOTA</u>				
Bismarck. Space conditioning for 10-story hotel. (J. Scholtz) ^c	Yes	Closed	Yes	7.3
<u>SOUTH DAKOTA</u>				
Presho. Space heating retrofit for school. (R. Jones, Superintendent)	Yes	Open	No	3.4
Kadoka. Space heating for residence and farm buildings. (J. Dunn)	Yes	Open	Yes	0.2
Kadoka. Space heating for high school. (L. Arnold, Superintendent).	No	Open	Yes	2.7
Midland. Space heating. (G. Stroppe)	Yes	Closed	No	Small
Rapid City. Space heating for educational retreat. (K. Trotter)	No	Open	No	Large
Lawrence County. Space heating for U.S. Fish and Wildlife Service buildings. (C. Olsen)	No	Open	No	1.1

a. Requester(s) name(s) in parentheses.
 b. Small = <10⁹ Btu/yr; large = >10⁹ Btu/yr.
 c. TA subcontract issued for this project.

TABLE A-1. (continued)

Site and Application by State ^a	Initial Contact CY-79	Active TA File	Field or Office Meeting	Annual Heat Load (x 10 ⁹ Btu) ^b
<u>SOUTH DAKOTA (continued)</u>				
Lemmon. District heating. (Mayor G. Smith) ^c	No	Open	No	Large
<u>UTAH</u>				
Ogden. Greenhouse. (G. Brusckke)	Yes	Open	No	Large
St. George. Air conditioning. (R. Tolman)	Yes	Closed	No	Large
Roosevelt Hot Springs. Property/site evaluation. (K. Griffin)	Yes	Closed	No	Not applicable
Crystal Hot Springs. Space heating for spa convalescent facility. (Dr. G. Cox)	Yes	Closed	Yes	0.8
American Fork. Greenhouse. (B. Johnson)	Yes	Closed	No	Large
Salt Lake City. Well test information. (G. Conrad)	Yes	Closed	No	Not applicable

- a. Requester(s) name(s) in parentheses.
- b. Small = <10⁹ Btu/yr; large = >10⁹ Btu/yr.
- c. TA subcontract issued for this project.

TABLE A-1. (continued)

Site and Application by State ^a	Initial Contact CY-79	Active TA File	Field or Office Meeting	Annual Heat Load (x 10 ⁹ Btu) ^b
UTAH (continued)				
Salt Lake City. Space conditioning for redevelopment site of 9 acres. Referred to State Team. (R. Turpin)	-- Yes	Closed	Yes	15.5
Salt Lake City. Heavy oil production. (L. Katz)	— No	Closed	No	6.0
Cedar City. Greenhouse. (J. Mennott)	Yes	Closed	No	
Monroe. Spa, greenhouse, aquaculture considered. (K. Mecham)	Yes	Closed	Yes	9.0
Wasatch Hot Springs. Spa heating. (L. Epperson)	No	Open	No	Large
Jones Hole. Space heating for U.S. Fish and Wildlife Service building. (C. Olsen)	No	Open	No	2.0
Abraham Hot Springs. Greenhouse and aquaculture. (D. Meyers)	No	Open	Yes	Small

a. Requester(s) name(s) in parentheses.
 b. Small = <10⁹ Btu/yr; large = >10⁹ Btu/yr.

TABLE A-1. (continued)

Site and Application by State ^a	Initial Contact CY-79	Active TA File	Field or Office Meeting	Annual Heat Load (x 10 ⁹ Btu) ^b
WYOMING				
Jackson. Space heating for U.S. Fish and Wildlife Service buildings. (C. Olsen)	Yes	Closed	No	Small
Midwest. District heating. (R. James)	No	Closed	No	94.0
Casper. Greenhouse and aquaculture. (R. Draper)	No	Open	No	Small
Beulah. Space heating for U.S. Fish and Wildlife Service buildings. (C. Olsen)	No	Open	No	5.4

a. Requesters(s) name(s) in parentheses.
 b. Small = <10⁹ Btu/yr; large = >10⁹ Btu/yr.

APPENDIX B

EXHIBITIONS ATTENDED FY-80

APPENDIX B

TABLE B-1. EXHIBITIONS ATTENDED--FY-80

Event; Location; and Dates	Estimated Number of Exposures
1. Utah Energy Expo '79; Salt Lake City, UT; October 11-13, 1979	60,000
2. University of Missouri/Department of Natural Resources Conference; Rolla, MO; October 16-18, 1979	2,000
3. 1979 Society of Mining Engineers-- American Institute of Mining, Metallurgical, and Petroleum Engineers Fall Meeting; Tucson, AZ; October 17-19, 1979	2,500
4. Arizona State Fair; Phoenix, AZ; October 19-November 4, 1980	75,000
5. International Conference on Energy Use Management; Los Angeles, CA; October 22-26, 1979	1,500
6. Energy Fair '79; Los Angeles, CA; November 2-4, 1979	70,000
7. Northern Nevada Energy Expo; Reno, NV; January 26-28, 1980	25,000
8. ASME Energy-Sources Technology Conference and Exposition; New Orleans, LA; February 4-6, 1980	5,000
9. National Water Well Association Ground Water Heat Pump Conference; Columbus, OH; February 11-12, 1980	10,000
10. IEEE Region 6 Conference; San Diego, CA; February 20-22, 1980	500
11. American Public Power Conference; Phoenix, AZ; February 25-28, 1980	500
12. National Rural Electric Cooperative Exposition; New Orleans, LA; March 3-5, 1980	5,000
13. Energy Technology 7; Washington, DC; March 24-26, 1980	7,000

TABLE B-1. (continued)

Event; Location; and Dates	Estimated Number of Exposures
14. Bio-Energy Conference; Atlanta, GA; April 21-24, 1980	3,500
15. Earth Day; Washington, DC; April 22, 1980	75,000
16. Southern Arizona Energy Awareness Fair; Tucson, AZ; April 28-May 4, 1980	15,000
17. Energy Expo; San Francisco, CA; May 14-18, 1980	40,000
18. Energy Fort Worth; Fort Worth, TX; August 8-9, 1980	35,000
19. Geothermal Resources Council Annual Meeting; Salt Lake City, UT; September 9-11, 1980	1,000

APPENDIX C

SPONSORING ORGANIZATIONS/PROFESSIONAL ASSOCIATIONS
EXPOSED TO GEOTHERMAL MATERIALS FY-80

APPENDIX C

TABLE C-1. SPONSORING ORGANIZATIONS/PROFESSIONAL ASSOCIATIONS EXPOSED TO GEOTHERMAL MATERIALS FY-80

Organization(s)/Associations(s)	Meeting/Place
Society of Mining Engineers-- American Institute of Mining, Metallurgical, and Petroleum Engineers	Fall Meeting/Tucson, Arizona
Interdisciplinary Group for Ecology, Development, and Energy	International Conference on Energy Use Management/Los Angeles, California
American Society of Mechanical Engineers; American Institute of Plant Engineers; American Society of Civil Engineers; American Society of Lubrication Engineers; American Society for Metals; Instrument Society of America; National Association of Corrosion Engineers	Energy-Technology Conference and Exposition/New Orleans, Louisiana
Institute of Electrical and Elec- tronic Engineers	Region 6 Conference/San Diego, California
American Public Power Association	Annual Meeting/Phoenix, Arizona
National Water Well Association	Geothermal Ground Water Heat Pump Conference/Columbus, Ohio
National Rural Electric Cooperative Association	Annual Meeting/New Orleans, Louisiana
American Gas Association Electric Power Research Institute, Gas Research Institute, National Coal Association	Energy-Technology 7/Washington, D.C.
Bio-Energy Council	Bio-Energy '80 World Congress