

Identifying Wells of Opportunity for Critical Geothermal Field Research Applications

DE-FOA-0002169

DATE: September 17, 2019

SUBJECT: Request for Information (RFI)

RESPONSE DUE DATE: 10/25/2019 at 5:00 PM Eastern Time

MODIFICATION: 000001

All modifications to the Request for Information are highlighted in green in the body of the RFI.

Description

The U.S. Department of Energy's (DOE) Geothermal Technologies Office (GTO) is interested in gathering information about underutilized wells in known geothermal resources in the United States. The information gathered will be used to gauge industry willingness to partner with GTO to test downhole tools, technologies, and methodologies that are currently at a TRL level below commercial readiness and understand the barriers to partnering this way. Wells above 175°C with low permeability are of highest interest, but others will be considered.

Background

Field testing new geothermal tools, technologies, and methodologies can improve the probability of successful commercialization. In fact, a fundamental goal of the Frontier Observatory for Research in Geothermal Energy (FORGE) initiative, located in Milford, Utah, is to provide the scientific community with a dedicated site to develop, test, and accelerate commercial breakthroughs for Enhanced Geothermal System (EGS) technologies. Research testing at FORGE will occur in Phase 3, including the drilling of two dedicated full-size directional wells for stimulation.

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA)

based on consideration of the input received from this RFI.

Due to the specific goals of the FORGE initiative and careful planning, prioritization, and timing of Phase 3 FORGE research and activities, the geothermal community may benefit from the opportunity to test at additional wells/sites outside of the FORGE Utah site. Phase 3 FORGE field activities and research will be focused on addressing EGS-specific technical challenges and a likely large number of emerging EGS and non-EGS geothermal tools and technologies in various stages of development that may require field testing. This may limit the number of high-potential, innovative research that could be conducted at FORGE, therefore necessitating additional sites testing.

Such additional sites, or Wells of Opportunity, (defined as previously drilled wells that are currently unutilized) can enhance FORGE and non-FORGE focused research. Currently in the U.S., there are geothermal wells spanning a variety of resource types, states of site infrastructure, and commercial operability. DOE GTO is interested in understanding the availability of this well infrastructure as a resource for field testing research. Figure 1 is a non-exhaustive range of technologies and methods that could be tested in Wells of Opportunity, from minimal intervention requirements to more comprehensive workover and resource development activities.

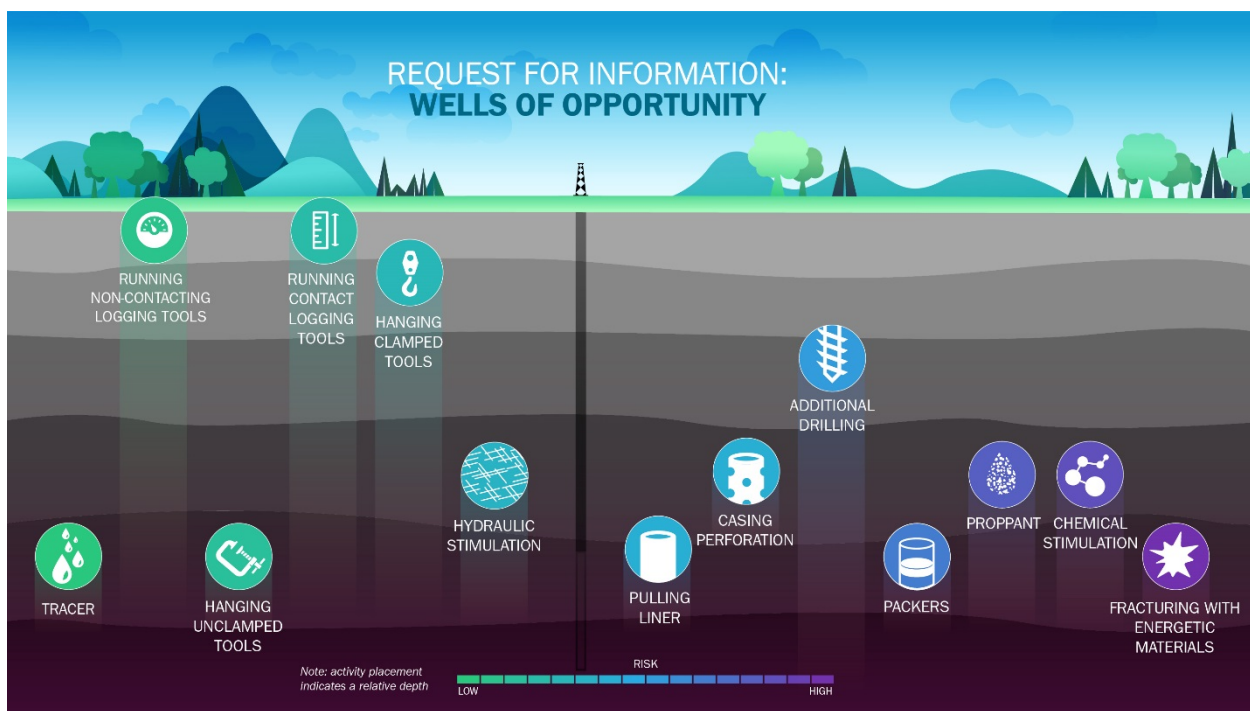


Figure 1 Research and testing activity examples along a qualitative well damage risk spectrum

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RFI.

Purpose

The purpose of this RFI is to solicit feedback from industry, academia, research laboratories, government agencies, and other stakeholders on existing Wells of Opportunity that DOE and partners can use for downhole testing of tools, technologies, and methodologies. EERE is specifically interested in information from stakeholders with available well infrastructure on their willingness to participate and allow research and testing for downhole tools, technologies, and methods in their well. Additionally, EERE is interested in stakeholder feedback on their well asset acquisition experiences for technology testing, development, or other purposes, particularly on what incentives were important towards obtaining the necessary infrastructure.

Disclaimer and Important Notes

This RFI is not a Funding Opportunity Announcement (FOA); therefore, EERE is not accepting applications at this time. EERE may issue a FOA in the future based on or related to the content and responses to this RFI; however, EERE may also elect not to issue a FOA. There is no guarantee that a FOA will be issued as a result of this RFI. Responding to this RFI does not provide any advantage or disadvantage to potential applicants if EERE chooses to issue a FOA regarding the subject matter. Final details, including the anticipated award size, quantity, and timing of EERE funded awards, will be subject to Congressional appropriations and direction.

Any information obtained as a result of this RFI is intended to be used by the Government on a non-attribution basis for planning and strategy development; this RFI does not constitute a formal solicitation for proposals or abstracts. Your response to this notice will be treated as information only. EERE will review and consider all responses in its formulation of program strategies for the identified materials of interest that are the subject of this request. EERE will not provide reimbursement for costs incurred in responding to this RFI. Respondents are advised that EERE is under no obligation to acknowledge receipt of the information received or provide feedback to respondents with respect to any information submitted under this RFI. Responses to this RFI do not bind EERE to any further actions related to this topic.

Proprietary Information

Because information received in response to this RFI may be used to structure future programs and FOAs and/or otherwise be made available to the public, **respondents are strongly advised to NOT include any information in their responses that might be considered business sensitive, proprietary, or otherwise confidential.** If, however, a respondent chooses to submit business sensitive, proprietary, or otherwise confidential information, it must be clearly and conspicuously marked as such in the response.

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RFI.

Responses containing confidential, proprietary, or privileged information must be conspicuously marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. The U.S. Federal Government is not liable for the disclosure or use of unmarked information, and may use or disclose such information for any purpose.

If your response contains confidential, proprietary, or privileged information, you must include a cover sheet marked as follows identifying the specific pages containing confidential, proprietary, or privileged information:

Notice of Restriction on Disclosure and Use of Data:

Pages [List Applicable Pages] of this response may contain confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for the purposes described in this RFI [DE-FOA-0002169]. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source.

In addition, (1) the header and footer of every page that contains confidential, proprietary, or privileged information must be marked as follows: “Contains Confidential, Proprietary, or Privileged Information Exempt from Public Disclosure” and (2) every line and paragraph containing proprietary, privileged, or trade secret information must be clearly marked with double brackets or highlighting.

Evaluation and Administration by Federal and Non-Federal Personnel

Federal employees are subject to the non-disclosure requirements of a criminal statute, the Trade Secrets Act, 18 USC 1905. The Government may seek the advice of qualified non-Federal personnel. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The respondents, by submitting their response, consent to EERE providing their response to non-Federal parties. Non-Federal parties given access to responses must be subject to an appropriate obligation of confidentiality prior to being given the access. Submissions may be reviewed by support contractors and private consultants.

Request for Information Categories and Questions

Please identify your answers by responding to a specific question or topic if applicable. Note that respondents may answer as many or as few questions as they wish.

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RFI.

Category 1: Well Characteristics and Availability

1. Please provide an inventory of wells that could be made available for testing of downhole tools and/or methods. Please provide details on the following characteristics as applicable:
 - a. Field and well location(s), surface and subsurface ownership or lease status, total acreage, and accessibility
 - b. Existing environmental activities (select those that apply)
 - i. Environmental Impact Statement complete
 - ii. Environmental Assessment complete
 - iii. Environmental Studies performed in area
 - iv. No history of environmental studies
 - c. Approved well(s) permit status (select those that apply and describe)
 - i. Drilled and commercial
 - ii. Drilled and not commercial
 - iii. Drilled and idle or active lease
 - d. Well characteristics, including:
 - i. Wellbore schematic or casing diameter/depth as built, including a description of completion schemes and open hole sections as applicable
 - ii. Former or current use (e.g. temperature gradient, injection, production, monitoring, etc.)
 - iii. List of well integrity logs and/or testing, and describe any known issues
 - iv. Drilling records
 - e. Generalized well geology, including:
 - i. Depth to resource
 - ii. Stratigraphy
 - iii. Lithology
 - iv. Stress state
 - v. Permeability related data
 - vi. Existing faults
 - vii. Fluid composition, chemistry, and flow characteristics
 - viii. Regional geologic characteristics, including:
 1. Stress direction and magnitude
 2. Availability of historic seismic data
 3. Current seismic monitoring array
 4. Paleo-seismic data
 5. Distance to existing faults, type of fault and size
 6. Level of seismic activity
 - ix. Thermal characteristics, including:

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RFI.

1. The last recorded bottom-hole temperature in the well(s)
2. Geothermal gradient
3. Thermal conductivity as a function of depth
2. Describe the amount of remediation required to make identified wells accessible using the estimated remediation cost ranges below:
 - a. Low costs to access available well (less than \$300,000)
 - b. Moderate costs to remediate well (\$300,000 to \$1,000,000)
 - c. High costs for well workover operations (more than \$1,000,000)
3. Please describe and provide costs previously borne by the U.S. Government for any drilling or work-over activity associated with identified wells.
4. Water availability on site, including a discussion on water rights (Select those that apply and describe)
 - a. Included/secured with land/lease deal
 - b. Can be purchased easily
 - c. Can be purchased with difficulty
 - d. Water rights not available
 - e. Type of water rights: senior/junior etc.
5. Electrical availability on site

Category 2: Risk

1. Referencing the risk scale depicted in Figure 1, please describe the range of acceptable research activities and technologies you would be willing to deploy in well(s) described in Category 1.
2. Is the evaluation of risk in Figure 1 reasonable? Would you rank a specific operation somewhere else on the continuum?
3. Are risks to well integrity identified in Category 1 the most important consideration in determining your willingness to allow research and testing to occur? If not, please describe other factors that contribute to this determination.
4. If there was a technology that has the potential to increase the value of the well (stimulation, recompletion, deepening, etc.) would you be more likely to accept testing of a high risk technology?
5. Please describe additional technologies not included in Figure 1 that would be acceptable for deployment in wells you described in your responses above in Category 1.
6. Would deployment of technologies listed in Figure 1 (or discussed in Question 3) require alteration of any existing NEPA determinations?

Category 3: Liability

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RFI.

1. Are the identified wells covered under any existing/active insurance plans (e.g. general liability, hole insurance, blowout insurance)? If so, please describe.
2. Please describe liability challenges.
3. What could be addressed by DOE relative to liability (or other) to incentivize participation?

Request for Information Response Guidelines

Responses to this RFI must be submitted electronically to GeothermalRFI@ee.doe.gov no later than 5:00pm (ET) on **October 25, 2019**. Responses must be provided as attachments to an email. It is recommended that attachments with file sizes exceeding 25MB be compressed (i.e., zipped) to ensure message delivery. Responses must be provided as a Microsoft Word (.docx) attachment to the email, and no more than 5 pages in length, 12 point font, 1 inch margins. **Attachments that include well data requested above may be included as additional Microsoft Excel (.xlsx) attachments.** Only electronic responses will be accepted.

Please identify your answers by responding to a specific question or topic if applicable. Respondents may answer as many or as few questions as they wish.

EERE will not respond to individual submissions or publish publicly a compendium of responses. A response to this RFI will not be viewed as a binding commitment to develop or pursue the project or ideas discussed.

Respondents are requested to provide the following information at the start of their response to this RFI:

- Company / institution name;
- Company / institution contact;
- Contact's address, phone number, and e-mail address.

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RFI.