

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U.S. Department of Energy
Energy Efficiency and Renewable Energy
Frontier Observatory for Research in Geothermal Energy (FORGE)
Funding Opportunity Announcement (FOA) Number: DE-FOA-0000890
FOA Type: Amendment 000001
CFDA Number: 81.087**

FOA Issue Date:	07/17/2014
Amendment 000001:	07/30/2014
Amendment 000002:	08/25/2014
Amendment 000003:	09/02/2014
Amendment 000004:	10/23/2014
Informational Webinar:	08/05/2014
Submission Deadline for Letter of Intent:	Not Required
Submission Deadline for Concept Papers:	Not Required
Deadline for FOA Questions:	11/06/2014
Submission Deadline for Applications:	11/12/2014
Submission Deadline for Optional Replies to Reviewer Comments:	01/16/2015
Expected Date for Selection Notifications:	03/30/2015

AMENDMENTS

All changes to the Funding Opportunity Announcement (FOA) as a result of this Amendment are highlighted in the body of the FOA.

Amendment No.	Date	Description of Amendments
000001	07/30/2014	The purpose of this Amendment is to incorporate the FOA webinar information. The webinar will be held on Tuesday, August 5 th from 11:00 a.m. to 1:00 p.m. Eastern Daylight Time. Registration for the Webinar is available at this link: https://www1.gotomeeting.com/register/929838952
000002	08/25/2014	The purpose of this Amendment is to extend the Submission Date for Applications. As a result of this extension, the Deadline for FOA Questions, the Submission Deadline for Optional Reply to Reviewer Comments and the Expected date for Selected Notifications have all changed.
000003	09/02/2014	The purpose of this Amendment is to incorporate a process that facilitates a Teaming Partner List for potential applicants. See Section IV.H.
000004	10/23/2014	The purpose of this Amendment is to clarify what items are excluded from the Technical Volume page limits (see Section IV.C.2.a.) and correct the Resume page limit in the Summary of Required Forms and Files (see Section IV.C.2.)

REGISTRATION REQUIREMENTS

There are several one-time actions that must be accomplished before submitting an Application in response to this Funding Opportunity Announcement (FOA), which are as follows:

- Register and create an account on EERE Exchange at <https://eere-Exchange.energy.gov/>. This account will then allow the user to register for any open EERE FOAs that are currently in EERE Exchange. It is recommended that each organization or business unit, whether acting as a team or a single entity, use only one account as the contact point for each submission.

The EERE Exchange registration does not have a delay; however, the remaining **registration requirements below could take several weeks to process and are necessary in order for a potential Applicant to receive an award under this FOA**. Therefore, although not required in order to submit an Application through the EERE Exchange site, **all potential Applicants lacking a DUNS number, or not yet registered with SAM or FedConnect should complete those registrations as soon as possible**.

- **Applicants should not wait until the last minute to begin the submission process.** During the final hours before the submission deadline, Applicants may experience server/connection congestion that prevents them from completing the necessary steps in EERE Exchange to submit their applications. **EERE will not extend the submission deadline for Applicants that fail to submit required information and documents due to server/connection congestion. Applications must be submitted through EERE EXCHANGE.**
- Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number (including the plus 4 extension, if applicable) at <http://fedgov.dnb.com/webform>.
- Register with the System for Award Management (SAM) at <https://www.sam.gov>. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in SAM registration. Please update your SAM registration annually.
- Register in FedConnect at <https://www.fedconnect.net/>. To create an organization account, your organization's SAM MPIN is required. For more information about the SAM MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf.
- **Electronic Authorization of Applications and Award Documents**
Submission of an application and supplemental information under this FOA through electronic systems used by the Department of Energy, including EERE Exchange, constitutes the authorized representative's approval and electronic signature.
- **Questions**
Questions related to the use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov.

Questions related to the FOA must be submitted to: DE-FOA-0000890-FORGE@netl.doe.gov and shall be submitted not later than 3 calendar days prior to the application due date which is the close of this FOA. Therefore, the deadline for submission of questions is 11/06/2014 Eastern Time. Any questions submitted after that time will NOT be addressed. Questions regarding problems encountered with the application submission process will be answered as time permits. Applicants are encouraged to review the posted questions and answers daily. Please be as specific as possible when asking questions to ensure that questions will be adequately addressed. Failure to be specific may result in additional time to address the question or require further correspondence for further clarification regarding the submitted question(s). All questions and answers related to this FOA will be posted at <http://eere.energy.gov/financing/Exchange> under the applicable FOA number. EERE will try to respond to questions within 3 to 5 business days, unless a similar question and answer have already been posted on the website.

EXECUTIVE SUMMARY

Federal Agency	U.S. Department of Energy
FOA Title	Frontier Observatory for Research in Geothermal Energy (FORGE)
FOA Type	Initial
FOA Number	DE-FOA-0000890
CFDA Number	81.087
Means of Submission	Applications and Replies to Reviewer Comments must be submitted through EERE Exchange at https://eere-Exchange.energy.gov , EERE's online application portal. EERE will not review or consider applications submitted through other means. The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements is found at https://eere-Exchange.energy.gov/Manuals.aspx
Total Amount to Be Awarded	Phase 1: \$2,000,000 in Federal Funds Phases 2: \$29,000,000 in Federal Funds (Subject to Appropriations) Phase 3: (Subject to Appropriations)
Anticipated Awards	Phase 1: Up to 10 awards for operator & site teams Phases 2A and 2B: Down select to no more than 3 awards for operator & site teams Phase 2C: Down select to 1 award for operator & site team Phase 3: 1 award for operator & site team, which will award multiple subsequent R&D subcontracts
Types of Funding Agreements	Cooperative Agreements
Period of Performance	Phase 1: 12 months Phase 2A: 4 months Phase 2B: 4 to 12 months Phase 2C: 4 to 8 months Phase 3: 60 months (anticipated to be split into 5 1-year budget periods)
Performance of Work in the United States / Eligibility	All Applicants must propose that 100% of the direct labor cost for the project (including contractor/subrecipient labor) will be incurred in the United States and its territories. (See Sections III.A. and IV.G.5. for more information).
Eligible Applicants	Individuals, Domestic Entities, Foreign Entities, Incorporated Consortia, Unincorporated Consortia, subject to the definitions in Section III.A.
Cost Share Requirement	Phase 1: No Cost Share Required Phases 2A, 2B, 2C and 3: 20% Cost Share Required The cost share requirement has been waived for any Prime Recipient and/or Subrecipient who is a domestic institution of higher education, national laboratory, FFRDC or domestic non-profit organization.
Submission of Multiple Applications	Applicants may submit more than one application to this FOA, provided that each application describes a unique project site.
Application Forms	Required forms for Applications are available on EERE Exchange at https://eere-Exchange.energy.gov , including the SF-424, SF-424A, Business Assurances Form, and Other Sources of Funding Disclosure Form. Applicants must use the templates available on EERE Exchange at https://eere-Exchange.energy.gov , including the template for the Technical Volume of the Application, the template for the Technical Milestones section of the Technical Volume and the Reply to Reviewer Comments template.

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SECTION I – FUNDING OPPORTUNITY DESCRIPTION

A. Introduction

The Department of Energy's (DOE) National Energy Technology Laboratory (NETL) on behalf of the DOE, Energy Efficiency and Renewable Energy (EERE) Geothermal Technologies Office (GTO) is seeking applications under this Funding Opportunity Announcement (FOA) for establishing and managing a dedicated Enhanced Geothermal Systems (EGS) field laboratory called the Frontier Observatory for Research in Geothermal Energy (FORGE). FORGE will focus on science and technology Research & Development (R&D) in an ideal EGS environment (see Section I.D.) in a domestic location. It is envisioned that FORGE will result in a rigorous and reproducible methodology that will enable development of on the order of 100+ GWe of cost-competitive EGS power, supporting the President's climate goals.

Projects under this FOA will be comprised of three Phases. Under Phase 1 Applicants will complete certain mission-critical technical and logistical tasks that demonstrate the proposed site's viability and the Applicant's full commitment and capability to implement Phase 2 and 3 activities of FORGE as envisioned by DOE. Phase 2 is comprised of three subphases that collectively involve preparation and demonstration of full readiness of the FORGE site, including detailed site characterization and full environmental compliance, as well as initial planning for technology testing R&D and evaluation in Phase 3. Phase 3 involves full implementation of FORGE and tasks specific to the identification, testing and evaluation of new and innovative EGS techniques and technologies.

DOE anticipates making up to 10 Phase 1 awards under this FOA. At the conclusion of Phase 1, a competitive “down select” will occur where it is anticipated that up to three of the Phase 1 Recipients will be selected to proceed into Phase 2A. All Phase 2A Recipients will be subject to a Go/No-Go decision point prior to Phase 2B, based on successful completion and results of Phase 2A activities, where it is anticipated that up to three of the Phase 2A Recipients will be selected to proceed into Phase 2B. At the completion of Phase 2B a second “down select” will occur resulting in only one Recipient being authorized to continue to Phase 2C. At the end of Phase 2C, there will be another Go/No-Go Decision Point where DOE will assess the readiness of the Recipient with regards to the state of subsurface characterization and the establishment of the necessary structure and framework to conduct Phase 3 R&D testing and evaluation. DOE reserves the right to fund, in whole or in part, any, all, or none of the Recipients of Phase 1 awards to move into subsequent phases. See Figure 1 for a summary.

B. Background

Enhanced Geothermal Systems are engineered reservoirs, created where there is hot rock but little to no natural permeability and/or fluid saturation. During EGS development, subsurface permeability is enhanced via fluid injection, thermal rock-fluid interaction, chemical stimulation, or other safe, well-engineered stimulation processes that re-open pre-existing fractures or create new ones. These open conduits increase permeability and allow fluid to circulate throughout the rock. This fluid transports heat to the surface where electricity can be generated with current power generation technologies. In the long term, EGS could enable utilization of a significant, geographically-diverse energy resource on the order of 100+ GWe ([U.S. Geological Survey, 2008](#)). While there are a number of historical and active EGS projects worldwide, technical barriers to commercialization remain, such as a thorough understanding of techniques to effectively stimulate fractures in different rock types; techniques capable of imaging permeability enhancement and evolution from the reservoir scale to the resolution of individual fractures; effective zonal isolation for multistage stimulations; directional drilling/stimulation technologies for non-vertical well configurations; and long-term reservoir sustainability and management techniques.

To surmount these technical barriers, there are several provisions within the Energy Independence and Security Act of 2007 (EISA), Title VI, Subtitle B that direct the Department of Energy's Geothermal Technologies Office to conduct “research, development, demonstration, and commercial application of the technologies and knowledge necessary for enhanced geothermal systems to advance to a state of commercial readiness.”

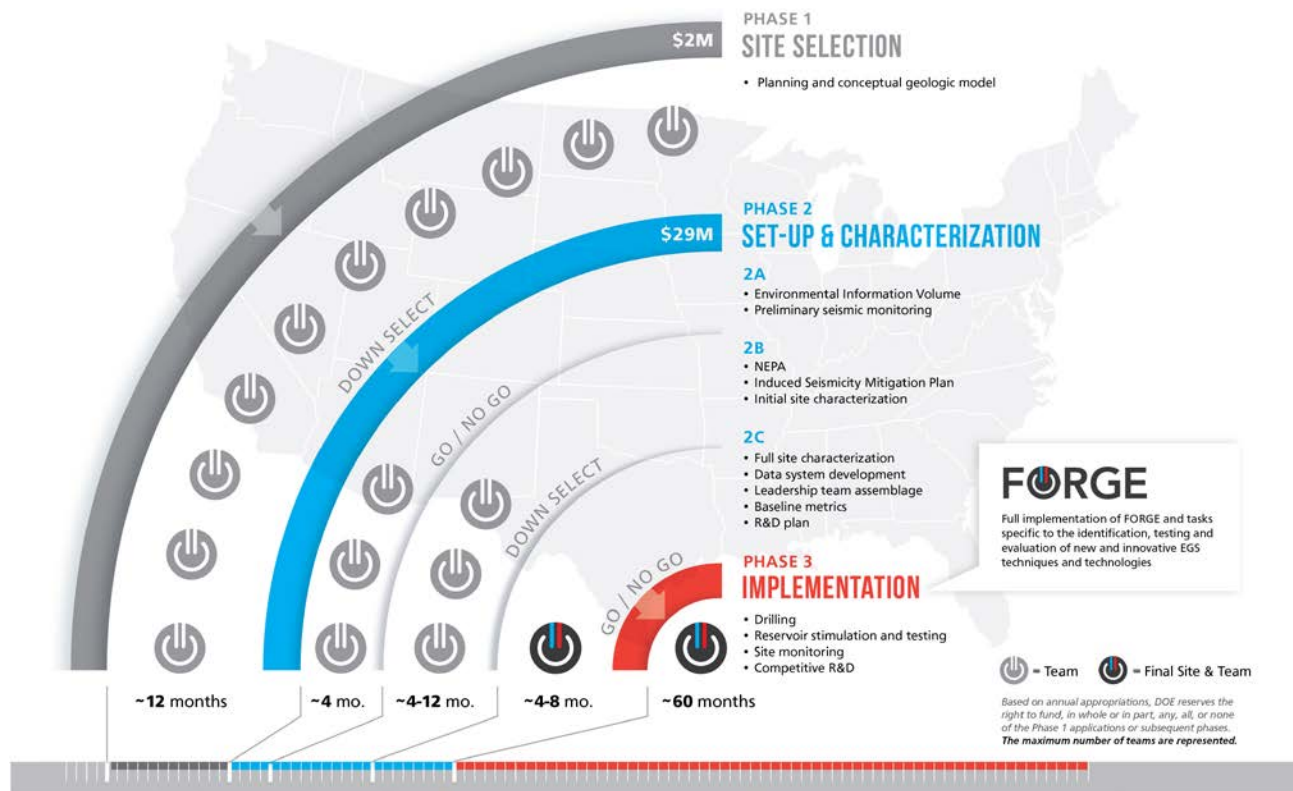


Figure 1. Summary of Core Activities and Decision Points*

*The Government reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA and will award the number of financial assistance instruments that serve the public purpose and are in the best interest of the Government. Activity descriptions are exemplary and not intended as comprehensive of all requirements.

GTO's current portfolio consists of numerous EGS R&D projects and five existing private-sector run [EGS demonstration projects](#). Current EGS R&D is focused on lowering the levelized cost of electricity (LCOE) while advancing technologies that fall into three categories associated with the EGS lifecycle (reservoir characterization, reservoir creation, and reservoir sustainability). The establishment of FORGE is the critical next step towards creating a commercial pathway for EGS, as it will promote transformative and high-risk science and engineering at a scale beyond the EGS demonstration projects funded by the DOE, and beyond what the private sector is financially capable of pursuing on its own. More information on the GTO and EGS, including GTO's portfolio of EGS projects can be found at:

<https://www1.eere.energy.gov/geothermal/index.html>
https://www1.eere.energy.gov/geothermal/enhanced_geothermal_systems.html

C. Purpose and Objectives

GTO's R&D activities are carried out in partnership with industry, academia, and DOE national laboratories to improve technologies for identifying, characterizing, accessing, and producing geothermal resources. GTO actively pursues EGS R&D projects to facilitate technology validation and deployment, reduce cost, and improve performance. While achieving cost-competitive electricity generation from EGS is a long-term goal, R&D projects will aid in moving industry along the learning curve toward technological readiness in the near-term.

This FOA is focused on GTO's vision for longer-term, transformational enhanced geothermal systems.

Specifically, the objective of this FOA is to establish and manage FORGE as a dedicated site where the subsurface scientific and engineering community will be eligible to develop, test and improve new technologies and techniques in an ideal EGS environment. This will allow the geothermal and other subsurface communities to gain a fundamental understanding of the key mechanisms controlling EGS success, in particular how to initiate and sustain fracture networks in the spectrum of basement rock formations using different stimulation technologies and techniques. This critical knowledge will be used to design and test a methodology for developing large-scale, economically sustainable heat exchange systems, thereby paving the way for a rigorous and reproducible approach that will reduce industry development risk. Essential to this process is a comprehensive instrumentation and data collection effort that will capture a higher-fidelity picture of EGS creation and evolution processes than any prior demonstration in the world. Finally, a dedicated FORGE allows for the highly integrated comparison of technologies and tools in a controlled and well-characterized environment, as well as the rapid dissemination of technical data to the research community, developers, and other interested parties.

D. Site Characteristics

The ideal FORGE site is well characterized, with high temperatures in the target formation in the range of 175-225 °C; moderate permeability of order 10^{-16} m², below the limit that typically supports natural hydrothermal systems; and with a target formation between 1.5-4 km depth, to avoid excessive costs associated with the drilling of new wells while attaining stress and temperature characteristics that are suitable to EGS and advancement of new technologies. The proposed site must not be within an operational hydrothermal field or sedimentary basin. Other site selection considerations include, but are not limited to, owner/lease holder commitment to the project, the readiness of the site as it pertains to environmental review and regulatory permitting, and the availability of existing nearby infrastructure necessary for carrying out the operation of FORGE.

E. Teaming

DOE anticipates that management of FORGE will require a multi-disciplinary team that has the demonstrated technical and financial viability to complete energy related projects (including engineering, installation, operation and management) of a large scale and complex nature. DOE envisions that operation of FORGE will be conducted by an integrated Site Management Team (SMT), similar in structure to that shown in Figure 2, consisting of the site owner or lease holder, a site operator, and a Science and Technology Analysis Team or equivalent technical monitoring body (STAT, from here forward in this document). The SMT may consist of industry, National Laboratory, academic, government agency, and other partners as appropriate. It is DOE's intent that key personnel supported by DOE outside the scope of this funding announcement who are deemed critical to the project's success may be incorporated into the Recipient's teams. Though GTO believes this structure to be optimal, all proposed management structures will be evaluated for their ability to effectively carry out the objectives of GTO and FORGE. Regardless of the organizational structure proposed, it is the prime recipient's responsibility to manage and coordinate FORGE activities to meet the overall objectives of the project consistent with the terms and conditions of the award.

Under the organizational structure envisioned by DOE, the Site Operator will have responsibility for all the day-to-day operations and management (administrative and financial) of FORGE. The Site Operator may utilize a site contractor, if necessary, to assist with critical tasks in support of FORGE and the execution of R&D field projects.

The SMT, as envisioned by DOE, will utilize a STAT, consisting of a group of best-in-class technical experts, to provide overall technical guidance and to ensure that GTO objectives are fully considered and incorporated into the execution of FORGE and associated R&D field projects. The STAT will play a critical role during Phases 2C and 3 of FORGE by assessing R&D needs in accordance with GTO roadmaps and goals, establishing technical baseline information and performance specifications, guiding ongoing site characterization and monitoring efforts, developing topics for recurring FORGE R&D solicitations, providing guidance for review and selection of R&D projects, and developing out-year R&D strategies. The STAT will also assess the progress and results of all R&D technology and techniques implemented at FORGE and provide input to the Site Operator for the development of annual Topical Reports. GTO will appoint at least 30% of the members on the STAT or other equivalent bodies (See Section VI.B.4.d. Statement of Substantial Involvement).

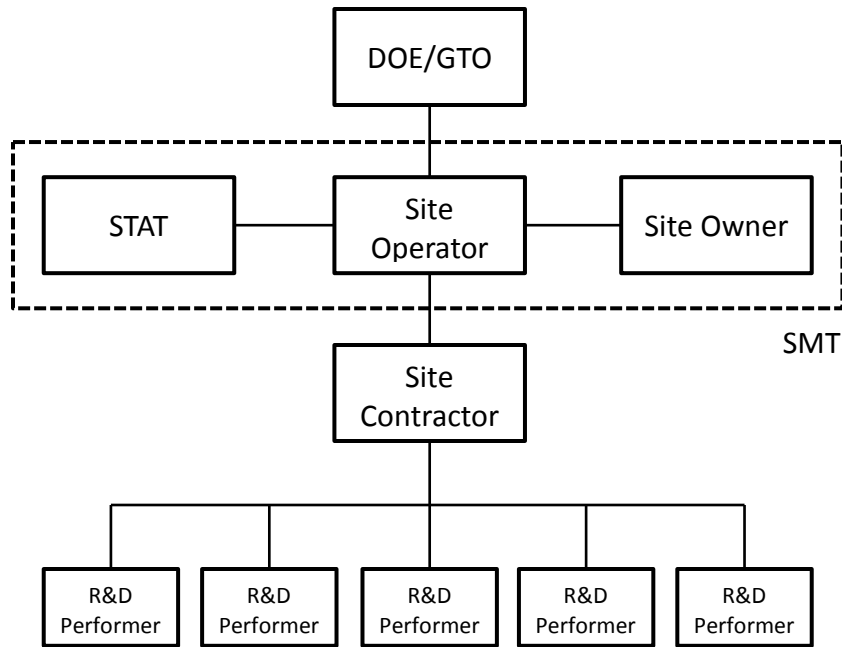


Figure 2. Site Management/Organizational Structure (Sample)

At a minimum, the SMT’s responsibilities will include the following:

- Carrying out technical, financial and administrative activities including the scheduling and contracting of sub-contractors for standard field services for the safe and cost-effective execution of FORGE and associated testing and evaluation of EGS technologies.
- Developing and implementing formal procedures in accordance with GTO goals and objectives for FORGE, review and award of EGS technologies for testing and evaluation, in collaboration with a STAT.
- Ensuring that all applicable state and federal permits have been acquired in support of FORGE activities and that all activities are compliant with the National Environmental Policy Act and other environmental, health and safety requirements, regulations or laws including the current version of the “Protocol for Induced Seismicity Associated with Enhanced Geothermal Systems”.
- Maintaining prompt and effective communication to DOE and with all interested stakeholders of ongoing activities at FORGE and of technical results stemming from individual R&D projects.
- Making all FORGE project and site data (existing, and collected during the project in Phases 2 and 3) available to the public through a FORGE Data System/Node compatible with the National Geothermal Data System (NGDS).

Proposed projects should consist of three distinct phases, with the second being split into Phases 2A, 2B and 2C. The objectives and requirements of each phase of the project are described in the subsequent paragraphs.

F. Phase 1 – Planning

The Phase 1 objective is to complete mission-critical technical and logistical tasks that demonstrate site viability and the Applicant’s full commitment and capability to meet envisioned FORGE objectives through Phases 2 and 3. Minimum requirements for Phase 1 include:

- Assess all available site characterization data;
- Compile site data into a conceptual geologic model of the proposed site;
- Archive site data used to support the conceptual geologic model to GTO’s Existing NGDS Node, the Geothermal Data Repository (GDR), which hosts all data collected or developed by GTO-funded awards;
- Finalize all teaming and cost-sharing arrangements; and

- Develop the following deliverables and operational plans, which, in Phase 3 will comprise key components of the Annual Operating Plan:
 - Conceptual Geologic Model: A Conceptual Geologic Model of the candidate FORGE site must be developed through integration and interpretation of existing data and any additional data acquired during Phase 1. The model should include graphical representations of key characteristics that reflect site suitability for meeting GTO project goals and objectives. While dynamic reservoir modeling is not required during Phase 1, quantitative and/or other probabilistic analyses should be undertaken to bound uncertainties in the distribution and magnitude of key subsurface parameters including the extent of target reservoir rock units, temperature profile, fluid content, permeability and porosity, structure and lithology, petrology, and stress regime. Supporting documentation should detail the data employed, the interpretation methodologies, and applicable quantitative uncertainty analyses and be included in the Phase 1 Topical Report. Supporting documentation should include an updated Site Characterization Data Inventory Appendix (See format in Attachment 3) with the Phase 1 Topical Report.
 - Data Dissemination and Intellectual Property Plan: A Data Dissemination and Intellectual Property Plan must be developed to promote the rapid dissemination of technical data to the geothermal community. This Plan should clearly outline the approach the Recipient will take to develop a modern, publically accessible Data System/Node compatible with NGDS, and detail the nature of and frequency for uploading technical project data to that system. The plan should include protocols for addressing intellectual property (IP) issues in Phase 2 and beyond in accordance with the Rights in Technical Data-Facility Provision (see Section VIII.P.) Throughout the project, competitively-selected R&D technology projects may have initial periods of exclusive data use, after which data will be made openly available. All other data and corresponding metadata will be made available without unnecessary delay, which in the majority of cases is near-real time. It is also envisioned that Recipients will implement a Technology Collaboration Agreement (see Attachment 8) for IP associated with R&D technology projects.
 - Update on Characterization Data uploaded to the GDR Data Archive (submitted as part of the Phase 1 Topical Report): The Recipient must make all data collected and data products developed during the project available to the public through the GDR (<https://gdr.openet.org>). The data must conform to the submission guidelines and data content models as provided by the GDR. The Recipient must submit supporting documentation for all data contributing to the Recipient's Phase 1 geologic model as part of the Phase 1 Topical Report, which must also be reflected in an updated Site Characterization Data Inventory Appendix (See format in Attachment 3), to be submitted at the end of Phase 1. Submission of all data contributing to the geologic model and any data contributing to the understanding of the proposed site, regardless of its proprietary status, date collected, or funding source, is encouraged (all proprietary data must be marked as described in Section VIII.E.) Ultimately, this data must be transferred to the FORGE Data System/Node as soon as the Recipient has established this system.
 - Core Curation Plan: A Curation Strategy Plan must be developed for any physical samples, including, but not limited to, core and cuttings. This strategy must outline plans for housing of physical samples throughout the project lifetime and beyond (with no long-term costs beyond the total project period permitted) and will discuss preservation of samples and a methodology for fair distribution of samples to interested entities.
 - Preliminary Induced Seismicity Mitigation Plan: FORGE must comply with current version of the "Protocol for Induced Seismicity Associated with Enhanced Geothermal Systems," http://www1.eere.energy.gov/geothermal/pdfs/geothermal_seismicity_protocol_012012.pdf. The Preliminary Induced Seismicity Mitigation Plan (ISMP) developed in Phase 1 should include a discussion and evaluation of the regional setting, structure, and stratigraphy as related to seismic risk, as well as a summary of any monitoring data collected prior to initiating the cooperative agreement.
 - Environmental, Safety and Health Plan: The Environmental, Safety and Health (ES&H) Plan must identify and analyze safety risks for existing and potential hazards or unsafe conditions associated with FORGE activities. The ES&H Plan must identify contact personnel responsible for on-site safety as well as provide for procedures and protocols for hazards communication, emergency evacuation and response, and any ES&H training requirements. ES&H requirements shall flow down to subcontractors.

- **Communications and Outreach Plan:** Recipient must develop a comprehensive and innovative plan for communications, education, and outreach across the proposed Site Management Team as well as with DOE and outside stakeholders to maintain sound operations and increase geothermal science and technology literacy. It is DOE's intent that this plan will also coordinate with other ongoing key communications, education, and outreach efforts supported by DOE outside of the scope of this funding announcement. The Communications and Outreach Plan must include the communications, education, and outreach methods (meetings, emails, reports, newsletters, teleconferences, websites, social media, internships, classroom engagements, etc.), a description of the intended audience (age group, geographic location, underrepresented status, etc.), conveyed information and material contents (technical, logistical, legal, etc.), and the frequency of the activities. The plan should include a specific approach and lines of communications for conflict resolution. Communications with local stakeholders should include frequent public meetings to report on FORGE status. The plan should also address workforce development through engaging students and educators (K-12 and higher education) onsite and in the classroom regarding EGS science and technology. Partnerships with professional communications and education specialists are highly encouraged.
- **Stakeholder Engagement Status Update** (submitted as part of the Phase 1 Topical Report): The Stakeholder Engagement Status Update should complement the forward-looking Communications and Outreach Plan by detailing activities around and progress in developing stakeholder relationships during Phase 1. Stakeholders as defined here could include, but are not limited to, other private or public research institutions or corporate partners not part of the Phase 1 team; Federal, state, and local governments and agencies; international partners; students and educators; and the general public. The Status Update must present approaches and lessons learned in forming agreements, educating stakeholders, navigating legal requirements, and other relevant engagements, and will supplement team and financial letters of commitment for formal partnerships.
- **Research and Development Implementation Plan:** Through the Research and Development (R&D) Implementation Plan, the Recipient should provide a discussion of their technical vision for FORGE and how it aligns with DOE's goals for the project. The plan should detail the Recipient's approach to effectively manage and coordinate all logistical, administrative, analytical, and technical support for the planning, solicitation, review, and selection of technologies that will be tested and evaluated at the FORGE site. The Recipient shall be required to implement formal procedures that ensure that technologies selected for testing and evaluation directly support the objectives of GTO. These procedures must ensure that the technology procurement process is fair, logical, competitive, and consistent with DOE and Federal guidelines and regulations. The R&D Implementation Plan is expected to outline recurring cycles for planning, review, and selection of FORGE-related technologies for testing and evaluation. An integral part of R&D implementation at FORGE will involve close collaboration with the proposed site management team. As part of this Plan, Recipients should describe the process for establishing and maintaining a technical expert team (e.g., STAT membership) to meet the above objectives and evolving technical needs. The approach must also address the management of conflicts of interest for participating members.
- **Environmental Information Synopsis:** The Environmental Information Synopsis should be approximately 5 pages and must describe the proposed environmental management activities associated with the project (e.g., waste management practices, reclamation activities, mitigation actions, best management practices, etc.). The narrative provided in the Environmental Information Synopsis should complement and be consistent with the information in the updated Site Characterization Data and Permitting Inventories. The Environmental Information Synopsis must include a permitting plan showing all the required permits/authorizations as well as a proposed schedule and budget to ensure that Phase 2A and 2B goals (i.e., completion of an Environmental Information Volume/NEPA) are achieved in the allotted time.

Phase 1 Down Select

At the completion of Phase 1, DOE will make a competitive down select resulting in up to 3 Recipients being authorized to proceed into Phase 2A. Recipients interested in continuing their project into Phase 2 will be required to submit a Renewal Application which will include a Phase 1 presentation and a Phase 1 Topical Report.

The Phase 1 presentation to DOE shall summarize Phase 1 results and address proposed scope for Phase 2A and 2B activities, as well as high-level plans for Phase 2C and 3 activities. Recipients desiring to continue their projects into Phase 2 will be required to submit an updated cost proposal consistent with their defined scope detailing costs associated with all site operations and decommissioning/disposition activities. ***Note: Updated cost estimates will be required of all Phase 2 Recipients at all Go/No-Go decision and down-select points.***

The details and logistics of the Phase 1 presentation will be provided to the Phase 1 Recipients approximately 30 days prior to the dates scheduled for the presentation. All Phase 1 Recipients are required to submit a Phase 1 Topical Report, regardless of whether or not the Recipient intends to submit a Renewal Application. Only Phase 1 Recipients are eligible to submit Renewal Applications, which are requests for additional funding. Renewal Applications must propose Phase 2 and 3 efforts at the site identified in the Applicant's Phase 1 award. Brief information on the Renewal Application requirements has been provided in the Model Cooperative Agreement attached to this FOA (Attachment 7). **Applicants that are selected to proceed beyond Phase 1 are hereby advised that the Phase 2 and 3 terms and conditions (for example, NEPA, cost share and Intellectual Property) will be subject to renegotiation and a financial viability review of the Applicant will be performed.**

For those Recipients not selected to proceed to Phase 2 or those that do not intend to submit a Phase 2 Renewal Application, the Final Phase 1 Topical Report will constitute the Final Project Report.

G. Phase 2 – Site Preparation and Characterization

The objective of Phase 2 is to fully instrument the site and bring FORGE to full readiness for the testing of new technologies and techniques in Phase 3. Phase 2 should include both administrative and logistical activities to achieve National Environmental Policy Act (NEPA) compliance, full characterization of the site and establishment of a long-term monitoring infrastructure with associated data sharing, implementation and updating (as necessary) of relevant plans as developed in Phase 1, updating (as necessary) the geologic model, and detailed planning for R&D technology testing and evaluation in Phase 3. Phase 2 is split into the following 3 subphases:

Phase 2A – Environmental Information Volume (EIV) and Preliminary Seismic Monitoring

The objective of Phase 2A is to establish the baseline information necessary to ensure that implementation of FORGE activities present no incompatible site conditions and that all necessary environmental conditions and NEPA requirements can be met in an adequate timeframe to meet the programmatic needs of DOE. Additional objectives of Phase 2A are to initiate site characterization activities that do not require additional NEPA approval, including establishing baseline seismic monitoring to comply with the Protocol for Addressing Induced Seismicity Associated with Enhanced Geothermal Systems and Best Practices for Addressing Induced Seismicity Associated with Enhanced Geothermal Systems and to incorporate data into the hazard evaluation portion of the Preliminary Induced Seismicity Mitigation Plan.

Specific Phase 2A requirements include:

- NEPA
 - A completed Environmental Information Volume (EIV), http://netl.doe.gov/File%20Library/Business/forms/451_1-1-6.pdf, that provides all initial environmental data and details about the proposed actions to take place at the site.
 - An updated schedule and detailed budget for the completion of the NEPA process in Phase 2B.
 - Presentation of the EIV to DOE and other applicable federal and state permitting agencies and affected/interested stakeholders.
- Preliminary Seismic Monitoring
 - Deployment of a telemetered seismic monitoring array comprised of at least 5 surface stations capable of recording seismic events with magnitudes as small as magnitude 1.0, and preferably magnitude 0.0 and a minimum of 30 days of recorded seismic data.

Phase 2A Go/No-Go Decision Point

At the completion of Phase 2A, Recipients are required to present Phase 2A preliminary seismic monitoring results (minimum of 30 days of recorded seismic data) as well as the findings of the EIV to DOE, other applicable federal (e.g., Bureau of Land Management) and state permitting agencies, and other affected stakeholders. The details and logistics of the Phase 2A presentation will be provided to the Recipients approximately 30 days prior to the dates scheduled for the presentation. Based on the availability of funding and successful completion of the EIV and other Phase 2A activities, including the installation of an initial seismic array and submittal of an updated cost proposal detailing costs associated with all site operation and decommissioning/disposition activities, Recipients may be authorized to proceed to Phase 2B.

Phase 2B – NEPA Compliance, Final Induced Seismicity Mitigation Plan, and Initial Site Characterization

Phase 2B will include both administrative and logistical activities to achieve NEPA compliance, and initial, non-invasive characterization of the site. At a minimum, Phase 2B requirements are:

- Conduct environmental reviews and obtain all permits and approvals in accordance with NEPA and other state and local requirements. All activities (characterization, monitoring, drilling, technology testing, stimulation, flow testing) will be considered in terms of their potential environmental impacts.
- Engage stakeholders, local communities and governments, and educational institutions (K-12 and higher education) to communicate the objectives of FORGE, describe the fundamentals of EGS technology, and prepare the community for planned FORGE activities.
- Finalize the Induced Seismicity Mitigation Plan, which incorporates MEQ data and associated analysis into a completed Probabilistic Seismic Hazard Analysis (PSHA), Criteria for Damage and Vibration, and Mitigation Actions for field testing.
- Perform non-invasive site characterization as permitted by NEPA status (including, but not limited to: detailed geothermometry, ground water/fluid geochemistry, hyperspectral imaging, aeromagnetism, gravity survey, magnetotellurics, InSAR, and tiltmeter surveys).
- Submit all site characterization and monitoring data collected to date to the GDR. Submit an updated Site Characterization Data Inventory to reflect any changes in the inventory.

Recipients must submit a Phase 2B Topical Report that demonstrates achievement of all necessary Phase 2B requirements. In addition, the report should include a brief discussion of the Recipient's approach for disposition of the site (e.g., demobilization of any equipment and facilities, remedial activities and transfer of land and subsurface ownership, as necessary) should Phase 2C FORGE activities not be authorized.

Phase 2B Down Select

At the completion of Phase 2B, DOE will make a down select resulting in only one Recipient being authorized to proceed into Phase 2C. This down select will be based on the project results to date including improved knowledge of the suitability of the FORGE site to meet GTO goals and objectives gained through non-invasive characterization activities and geologic modeling in Phases 2A and B, NEPA approval (e.g., CX, FONSI, or ROD), and demonstrated site readiness including submittal of an updated cost proposal detailing costs associated with all site operation and decommissioning/disposition activities, as well as the availability of funding.

Applicants that successfully meet Phase 2B requirements but are not selected to proceed into Phase 2C may be considered as alternates.

Phase 2C – Subsurface Characterization and Site Readiness

The objective of Phase 2C is to fully instrument the site and bring FORGE to full readiness for R&D technology testing and evaluation in Phase 3. At a minimum, Phase 2C requirements are:

- Perform high-resolution geophysical, geochemical, and geological data acquisition and analysis to meet critical project setup goals, including, but not limited to, (1) further characterization of the in-situ stress field utilizing various techniques and (2) further characterization of fluid content and composition at depth. Data should be acquired through dedicated thermal-gradient, corehole, and/or microhole drilling. DOE also encourages the use of such wells for testing of fluid and heat transport properties at less than reservoir scale that could help constrain system heterogeneity and possible performance.

- Design and deploy a permanent, high-resolution, surface and subsurface seismic monitoring system (via dedicated monitoring boreholes) that supplements the initial surface array and complies with the “Protocol for Induced Seismicity Associated with Enhanced Geothermal Systems,” to provide continuous monitoring for baseline and perturbed states throughout the project duration.
- Refine Phase 1 conceptual geologic site model to incorporate new characterization and monitoring data.
- Conduct dynamic reservoir modeling based on the refined geologic site model to inform drilling and stimulation design for Phase 3.
- Implementation of a NGDS-compatible, data-sharing mechanism (FORGE Data System/Node) for real-time sharing of all baseline site characterization and monitoring data.
- Share all site characterization and monitoring data collected in Phase 2 via the FORGE Data System/Node.
- Establish a STAT (including charter and governance structure) in accordance with the Statement of Substantial Involvement (see Section VI.B.4.d.) to provide overall technical guidance throughout Phases 2C and 3, and to ensure that DOE objectives are fully considered and incorporated into the execution of FORGE and associated R&D projects.
- Convene initial meeting(s) of the STAT to assess the current state of technology and establish technical baseline information and performance metrics for FORGE activities, as well as to address the overall technical implementation plan, determine topics for the 1st round of R&D solicitation(s) during Phase 3 and produce a draft of said solicitation ready for issuance at start of Phase 3.
- Applicants may be required to incorporate field testing, in some cases, of methodologies/tools/procedures developed through GTO’s FY14 FOA DE-FOA-0000842 – Integrated Enhanced Geothermal Systems (EGS) Research and Development (funded by DOE) which focuses on subsurface characterization. Deployment of these technologies/methodologies can take place in Phase 2C or at any time in Phase 3 depending on the sequencing of the Applicant’s multi-year R&D strategy.
- Prepare Final Phase 2 Topical Report (summarizing activities in all of Phase 2) and Annual Operating Plan (AOP) for Phase 3, year 1 technology testing and evaluation.

Phase 2C Go/No-Go Decision Point

Phase 2C will end with a Go/No-Go Decision Point, where DOE will assess the readiness of the site with regards to subsurface characterization data collected; the establishment of the necessary structure and framework to conduct R&D solicitations, testing and evaluation, and other required Phase 3 activities; and submittal of an updated cost proposal detailing costs associated with all site operation and decommissioning/disposition activities. ***An alternate, if specified at the end of Phase 2B, may be asked to perform if the original Recipient fails to meet Phase 2C requirements.***

H. Phase 3 – Technology Testing and Evaluation

Phase 3 involves full implementation of FORGE and tasks specific to the solicitation, selection, testing and evaluation of new and innovative EGS tools, techniques, and supporting science. Minimum requirements include drilling of preferably two or more operational, full sized well(s); reservoir stimulation; and well connectivity and flow-testing efforts that manifest significantly increased performance per well over that realized at prior EGS field demonstrations. It is anticipated that this will include wells optimized to the in-situ stress field including highly deviated or fully horizontal configurations as well as new technologies and approaches for implementing and monitoring multi-zone stimulations. The Applicant may also choose to propose the drilling of auxiliary wells or to utilize existing wells for R&D efforts complementary to the primary EGS. This could include the use of such wells for testing of fluid and heat transport properties at less than reservoir scale to improve understanding of site heterogeneity and possible performance, feeding into large-scale operations planning.

To capture a high-fidelity picture of EGS creation and evolution processes, it is required that continuous monitoring of microseismic activity and other geophysical and geochemical signatures initiated in Phase 2 will continue throughout Phase 3. Characterization and monitoring data must be made available to the community via the FORGE Data System/Node in real-time. In addition, robust and ongoing dynamic reservoir modeling efforts are expected to substantively inform drilling and stimulation design and other fundamental R&D decisions.

All of these efforts will require careful integration of primary surface and subsurface site operations and infrastructure with an expansive and competitive R&D program, open to the broader scientific and engineering community and other key partners as established during the project. This may include collaborations on crosscutting R&D with other DOE offices engaged in complementary subsurface energy research, and/or incorporation of other key personnel supported by DOE outside of the scope of this funding announcement into the Applicant's project team.

During Phase 3 it is anticipated that annual R&D solicitations will be issued with 10-20 subcontracts awarded for research and technology testing per competition (subject to annual appropriations) in the following EGS lifecycle categories:

- Reservoir characterization (coupled imaging, drilling for interrogation and monitoring, high-temperature tools and sensors)
- Reservoir creation (formation access, fracture characterization, zonal isolation, stimulation technologies)
- Reservoir sustainability (long-term testing, monitoring, and operational feedback)

All entities (including industry, universities, Federally Funded Research and Development Centers, non-profit organizations, government agencies, etc.) will be eligible to submit proposals to the SMT-issued solicitations as individual entities or teams for the purpose of testing and evaluating innovative tools and techniques at FORGE.

At least 50% of annual Phase 3 FORGE funding must be directed towards these competitive R&D solicitations, exclusive of funds dedicated to innovative drilling and flow testing.

Communications, education, and outreach efforts should also continue throughout the entirety of Phase 3, focused on EGS themes relevant to annual R&D testing at FORGE, innovative drilling operations, stimulation activities, flow testing, and sustainability techniques. It is DOE's intent that these ongoing efforts will be coordinated with key communications, education, and outreach efforts supported by DOE outside of the scope of this funding announcement.

Phase 3 activities will require the development of an Annual Operating Plan (AOP). The required minimum content of the AOP will be provided to the Phase 2C Recipient. AOPs, approved by DOE, will identify any necessary updates to operational Plans initially developed during Phase 1.

Demonstration of commercial-scale power production is not considered a goal of the FORGE project and will not be permitted during the award period in order to maintain focus on developing a repeatable strategy for EGS reservoir creation. However, technology testing and evaluation of innovative power generation technologies tailored to EGS resources may be considered in year five of Phase 3.

The following represents expected Phase 3 activities and potential milestones, but does not preclude the Applicant from presenting alternate and/or additional activities that meet DOE's objectives for FORGE:

Activities:

- Continuous monitoring of site seismicity and other geophysical and geochemical signatures.
- Regular refinements of site geologic models and associated reservoir models based on collected data and utilized to inform all operations at FORGE.
- Design and drilling of auxiliary well(s) for R&D complementary to the primary EGS wells.
- Design and drilling of two full-sized wellbores optimized to the in-situ state of stress (anticipated to be highly deviated or fully horizontal).
- Implementation of novel reservoir stimulation technologies and methodologies (e.g., non-hydraulic, multi-zone, and simultaneous stimulation of multiple wells).
- Issue annual R&D solicitations (~10-20 awards per year) focused on development of subsurface technologies and/or testing/validation of existing technologies; auxiliary-well activities; well characterization and multi-well stimulation technologies; inter-well connectivity; and long-term reservoir

sustainability techniques. At least 50% of annual Phase 3 FORGE funding must be directed towards these competitive R&D solicitations, exclusive of funds dedicated to innovative drilling and flow testing.

- Real-time sharing of characterization and monitoring data and annual dissemination of data, physical samples, and results from drilling operations and R&D projects.
- Continued robust implementation of all operational plans.
- Innovative continuous and long-term flow testing.

Milestones:

- At the start of Phase 3 demonstrate full functionality of an NGDS-compatible, data-sharing mechanism (FORGE Data System/Node) for real-time sharing of all site characterization and monitoring data.
- At the conclusion of year 1, design of first FORGE well based on in-situ stresses and informed by continuously updated reservoir models. Initiate drilling of first well in year 2.
- Issue R&D solicitations annually and ensure all awards are made and work initiated within the fiscal year of solicitation release.
- Demonstrate sustained functionality of transient reservoir interrogation tools at 200 °C for at least 6 months or in-situ monitoring tools for at least one year.
- Demonstrate at least three innovative stimulation techniques for initiating or re-opening fractures.
- Demonstrate the ability to enhance multiple reservoir volumes from a single wellbore and correlate to progressively-increased well performance as a function of number of stimulated zones.
- Demonstrate innovative precision geophysical methods that increase spatial resolution of subsurface features over state-of-the-art and validate methods with actual subsurface data or mineback.
- Demonstrate the functionality of innovative drilling tools and components capable of operating at 200+ °C in crystalline rock, uninterrupted for 30 hours.
- Demonstrate validation of reservoir and site models based on ability to predict post-stimulation fracture initiation directions, total reservoir volume, and connectivity.
- Validate the capability of new tracers to improve flow path, volume, and fracture surface area estimates.
- Develop sufficient flow paths between wellbores over a reservoir volume greater than 1 km³ and quantitatively constrain their capacity to sustain production with less than 2°C temperature decline over one year.
- Demonstrate a methodology for reproducible EGS reservoir creation and sustainability.
- Demonstrate completion of facility decommissioning/disposition and/or ownership transfer eliminating all DOE future liability within budgeted costs.

SECTION II – AWARD INFORMATION

A. Type of Award Instrument

EERE anticipates awarding cooperative agreements under this FOA (See Part VI.B.4.d. Statement of Substantial Involvement).

EERE generally uses Cooperative Agreements to provide financial and other support to Recipients. EERE encourages Recipients to review the Model Cooperative Agreement, which is available as an attachment to this FOA. EERE created the Model Cooperative Agreement to facilitate and expedite award negotiations. By submitting an application under this FOA, you agree to the terms in the Model Cooperative Agreement. The negotiated Special Terms and Conditions may vary depending on the project type (e.g., Demonstration or R&D) or the Recipient entity type (e.g., Commercial or Nonprofit).

EERE may utilize the Field Work Proposal or Inter-Entity Work Order process to make awards to DOE/NNSA Federally Funded Research and Development Center (FFRDC) Applicants.

B. Estimated Federal Funding

Approximately \$2,000,000 of Federal funding is available for Phase 1 awards in FY 2014. Approximately \$29,000,000 of Federal funding is expected to be available for Phase 2 Recipients. Phase 3 funding under this FOA for FY 2015 through FY 2020 will be determined by appropriations and based on meeting project goals and milestones. **Federal funding for all awards and future budget periods/phases is contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.**

C. Expected Number of Awards

EERE anticipates making up to 10 awards under Phase 1 of this FOA. Phase 1 Recipients proposing to continue their project into Phase 2A will have the opportunity to submit a Renewal Application. Through a competitive down select, EERE anticipates selecting up to three awards to continue into Phases 2A and 2B. A second competitive down select at the end of Phase 2B will determine the final Recipient who continues their project into Phases 2C and 3.

D. Anticipated Total Award Amount (Federal and Non-Federal share)

The total amount for Phase 1 awards is up to be \$2,000,000. The total amount for Phase 2A awards is anticipated to be \$2,000,000. The total amount for Phase 2B awards is anticipated to be \$17,000,000. The total amount for the Phase 2C award is anticipated to be \$10,000,000.

If a decision is made to initiate Phase 3 activities and funds are appropriated, EERE anticipates funding between FY2016 – FY2020 to be commensurate with the out year activities described herein. **Federal funding for all awards and future budget periods is contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.**

There is no cost share requirement for Phase 1. The cost share requirement for Phases 2A, 2B, 2C, and 3 is 20%. The cost share requirement has been waived for any Prime Recipient and/or Subrecipient who is a domestic institution of higher education, national laboratory, FFRDC, or domestic non-profit organization. Cost share must be calculated based on the total allowable costs for the applicable entity (i.e., the sum of the Government share and the entity share of allowable costs equals the total allowable cost for the entity) and must come from non-Federal sources unless otherwise allowed by law. (See 10 CFR Part 600 for the applicable cost sharing requirements.) The cost share requirement for organizations participating under any sort of teaming arrangement will be defined by the business type of the participating organization(s). It is therefore possible that should a for-

profit organization team with a domestic institution of higher education, national laboratory, FFRDC, or domestic non-profit organization, the for-profit organization must provide cost share in an amount that is not less than 20% of the for-profit organization's portion of the project costs and the domestic institution of higher education, national laboratory, FFRDC, or domestic non-profit shall have a 0% cost share requirement. The applicability of this cost share waiver to R&D performers (regardless of the type of entity) selected from Operator-run solicitations in Phase 3 will be determined at the end of Phase 2C.

Table 1. Summary of Anticipated Phases, Duration, Funding, and Cost Share*

	Anticipated Length		(\$M)							Federal Funding (\$M)	Required Cost Share, For-Profits (\$M)	Required Cost Share, Applicable Entities [†] (\$M)
	No. Awards	(mo.)	2014	2015	2016	2017	2018	2019	2020			
Phase 1	10	12	\$2							\$2	\$0	\$0
Phase 2A	Up to 3	4		\$2						\$2	\$0.50	\$0
Phase 2B	Up to 3	4-12		\$17						\$17	\$4.25	\$0
Phase 2C	1	4-8		\$10						\$10	\$2.50	\$0
Phase 3	1	60	subject to annual appropriations								20%	0%

*The Government reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA and will award the number of financial assistance instruments that serve the public purpose and are in the best interest of the Government. All DOE funding is subject to annual Congressional appropriations.

[†]Applicable entities, as noted above, are Recipients and/or Subrecipients who are a domestic institutions of higher education, national laboratory, FFRDC, or domestic non-profit.

E. Period of Performance

EERE anticipates Phase 1 awards will run for one year, but work must be completed within the first 9 months to allow for the down select process. EERE anticipates a 4-month period of performance for Phase 2A and a 12-month period of performance for Phase 2B. EERE anticipates up to 8 months for Phase 2C and up to 5-years for the period of performance for Phase 3 activities.

F. Type of Application

EERE will accept only new applications under Phase 1 of this FOA (i.e., applications for renewals of existing EERE-funded projects will not be considered).

SECTION III - ELIGIBILITY INFORMATION

A. Eligible Applicants

As a condition under this announcement, all Applicants must propose that 100% of the direct labor cost for the project (including contractor/subrecipient labor) will be incurred in the United States (including U.S. territories) unless the Applicant can demonstrate to the satisfaction of the EERE that the United States economic interest will be better served through some percentage of work performed outside the United States. See Section IV.G. 5. for waiver request information. Approval is at the sole discretion of EERE. For example, an Applicant may provide evidence that expertise to develop a technology exists only outside the United States, but that ultimate commercialization of the technology will result in substantial benefits to the United States such as improved electricity reliability, increased employment, increased exports of U.S.-manufactured products, etc. In these cases, the Applicant must request a waiver of this requirement. This waiver must be included as part of the Application submitted to DOE. (See Section IV.G.5. for more information)

1. Individuals

U.S. citizens and lawful permanent residents are eligible to apply for funding as a Prime Recipient or Subrecipient.

2. Domestic Entities

For-profit entities, educational institutions, and nonprofits¹ that are incorporated (or otherwise formed) under the laws of a particular State or territory of the United States are eligible to apply for funding as a Prime Recipient or Subrecipient.

State, local, and tribal government entities are eligible to apply for funding as a Prime Recipient or Subrecipient.

DOE/NNSA Federally Funded Research and Development Centers (FFRDCs) are eligible to apply for funding as a Prime Recipient or Subrecipient. NOTE: NETL is not eligible for award under this announcement and may not be proposed as a team member on another entity's application.

Non-DOE/NNSA FFRDCs and non-DOE Government-Operated-Government-Owned Entities (GOGOs) are eligible to apply for funding as a Subrecipient, but are not eligible to apply as a Prime Recipient.

Federal agencies and instrumentalities (other than DOE) are eligible to apply for funding as subrecipient, but are not eligible to apply as a Prime Recipient.

3. Foreign Entities

Foreign entities, whether for-profit or otherwise, are eligible to apply for funding under this FOA.

Other than as provided in the "Individuals" or "Domestic Entities" sections above, all Prime Recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a Prime Recipient, it must designate in the Application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States

¹Nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, are not eligible to apply for funding.

to be the Prime Recipient. The Application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate. Foreign entities may request a waiver of this requirement in the Application. See Section IV.C.2.h. for waiver request information. The DOE Contracting Officer has discretion to waive this requirement if he/she determines that it will further the purposes of this FOA and is otherwise in the interests of EERE.

A foreign entity may receive funding as a Subrecipient.

4. Incorporated Consortia

Incorporated consortia, which may include domestic and/or foreign entities, are eligible to apply for funding as a Prime Recipient or Subrecipient. For consortia incorporated (or otherwise formed) under the laws of a State or territory of the United States, please refer to “Domestic Entities” above. For consortia incorporated in foreign countries, please refer to the requirements in “Foreign Entities” above.

Each incorporated consortium must have an internal governance structure and a written set of internal rules. Upon request, the consortium must provide a written description of its internal governance structure and its internal rules to the DOE Contracting Officer.

5. Unincorporated Consortia

Unincorporated consortia, which may include domestic and foreign entities, must designate one member of the consortium to serve as the Prime Recipient/consortium representative. The Prime Recipient/consortium representative must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. The eligibility of the consortium will be determined by the eligibility of the Prime Recipient/consortium representative under Section III.A.

Upon request, unincorporated consortia must provide the DOE Contracting Officer with a collaboration agreement, commonly referred to as the articles of collaboration, which sets out the rights and responsibilities of each consortium member. This agreement binds the individual consortium members together and should discuss, among other things, the consortiums:

- Management structure;
- Method of making payments to consortium members;
- Means of ensuring and overseeing members' efforts on the project;
- Provisions for members' cost sharing contributions; and
- Provisions for ownership and rights in intellectual property developed previously or under the agreement.

B. Cost Sharing

There is no cost share requirement for Phase 1. The cost share requirement for Phases 2A, 2B, 2C, and 3 is 20%. The cost share requirement has been waived for any Prime Recipient and/or Subrecipient who is a domestic institution of higher education, national laboratory, FFRDC, or domestic non-profit organization.

Cost share must be calculated based on the total allowable costs for the projects (i.e., the sum of the Government share, including FFRDC costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law. (See 10 CFR Part 600 for the applicable cost sharing requirements.) The cost share requirement for organizations participating under any sort of teaming arrangement will be defined by the business type of the participating organization(s). It

is therefore possible that should a for-profit organization team with a domestic institution of higher education, national laboratory, FFRDC, or domestic non-profit organization, the for-profit organization must provide cost share in an amount that is not less than 20% of the for-profit organization's portion of the project costs and the domestic institution of higher education, national laboratory, FFRDC, or domestic non-profit shall have a 0% cost share requirement. A determination on the applicability of this cost share waiver to R&D performers (regardless of the type of entity) selected from Operator-run solicitations in Phase 3 will be determined at the end of Phase 2C.

1. Legal Responsibility

Although the cost share requirement applies to the Project Team as a whole, the assistance agreement makes the Recipient legally responsible for providing the entire cost share. The Recipient's cost share obligation is expressed in the assistance agreement as a static amount in U.S. dollars (cost share amount) and as a percentage of the Total Project Cost (cost share percentage). If the funding agreement is terminated prior to the end of the project period, the Recipient is required to contribute at least the cost share percentage of total expenditures incurred through the date of termination.

The Recipient is solely responsible for managing cost share contributions by the Project Team and enforcing cost share obligations assumed by Project Team members in subawards or related agreements.

2. Cost Share Allocation

Each Project Team is free to determine how much each member will contribute towards the cost share requirement. The amount contributed by individual Project Team members may vary, as long as the cost share requirement for the project as a whole is met.

3. Cost Share Types and Allowability

Every cost share contribution must be allowable under the applicable Federal cost principles, as described in Section IV.G.1.

Project Teams may provide cost share in the form of cash or in-kind contributions. Cash contributions may be provided by the Recipient or Subrecipients. Allowable in-kind contributions include but are not limited to personnel costs, indirect costs, facilities and administrative costs, rental value of buildings or equipment, and the value of a service, other resource, or third party in-kind contribution. Project Teams may use funding or property received from state or local governments to meet the cost share requirement, so long as the funding or property was not provided to the state or local government by the Federal Government.

The Recipient may not use the following sources to meet its cost share obligations, including, but not limited to:

- Data collected by previous Federal awards (grants, cooperative agreements, etc.);
- Revenues or royalties from the prospective operation of an activity beyond the project period;
- Proceeds from the prospective sale of an asset of an activity;
- Federal funding or property (e.g., Federal grants, equipment owned by the Federal Government);
- Expenditures that were reimbursed under a separate Federal program; or
- Bank loans from financial institutions (loan meaning funds borrowed from a financial institution which will later be paid back in full).

In addition, Project Teams may not use independent research and development (IR&D) funds to meet their cost share obligations. Project Teams may not use the same cash or in-kind contributions to meet cost share requirements for more than one project or program.

Cost share contributions must be specified in the project budget, verifiable from the Recipient's records, and necessary and reasonable for proper and efficient accomplishment of the project. All sources of cost share are considered part of total project cost, the cost share dollars will be scrutinized under the same Grant/Cooperative Agreement Federal regulations as Federal dollars to the project. Every cost share contribution must be reviewed and approved in advance by the Contracting Officer and incorporated into the project budget before the expenditures are incurred.

Applicants are encouraged to refer to 10 C.F.R. Part 600 for additional guidance on cost sharing, specifically 10 C.F.R. §§ 600.30, 600.123, 600.224, and 600.313.

4. Cost Share Contributions by FFRDCs and GOGOs

Because FFRDCs and GOGOs are funded by the Federal Government, costs incurred by FFRDCs and GOGOs generally may not be used to meet the cost share requirement. FFRDCs may contribute cost share only if the contributions are paid directly from the contractor's Management Fee or a non-Federal source.

5. Cost Share Verification

Applicants are required to provide written assurance that they can meet their proposed cost share contributions in their Applications.

Upon selection for award negotiations, Applicants are required to provide additional information and documentation regarding their cost share contributions. Please refer to Attachment 2 of the FOA for guidance on the requisite cost share information and documentation.

C. Other Eligibility Requirements

1. DOE/NNSA and Other Federally Funded Research and Development Center (FFRDC) Contractors

A DOE/NNSA FFRDC Contractor is eligible to apply for funding under this FOA, or be proposed as team members on another entity's application, if its cognizant Contracting Officer provides written authorization and this authorization is submitted with the application. If a DOE/NNSA FFRDC Contractor is selected for award, the proposed work will be authorized under the DOE work authorization process and performed under the laboratory's Management and Operating (M&O) contract.

The following wording is acceptable for the authorization:

“Authorization is granted for _____ to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory, and will not adversely impact execution of the DOE assigned programs at the laboratory.

A Non-DOE FFRDC contractor is also eligible for funding under this FOA, or may be proposed as team members on another entity's application if its cognizant Contracting Officer provides written authorization and this authorization is submitted with the application. If a non-DOE FFRDC is selected for award, the proposed work will be authorized through an Interagency Agreement. The Federal agency sponsoring the FFRDC contractor must authorize in writing the use of the FFRDC contractor on the proposed project and this authorization must be submitted with the application. The use of a FFRDC contractor must be consistent with the contractor's authority under its award.

The following wording is acceptable for this authorization:

“Authorization is granted for _____ to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory and will not adversely impact execution of the DOE assigned programs at the laboratory. THIS LABORATORY IS AUTHORIZED TO PERFORM THE WORK PROPOSED IN THE APPLICATION SUBMITTED UNDER DOE FUNDING OPPORTUNITY ANNOUNCEMENT # DE-FOA-0000890 BY THE FOLLOWING STATUTORY AUTHORITY [insert Statute name, citation, and section]_____.”

Value/Funding. The value of, and funding for, the FFRDC contractor portion of the work will not normally be included in the award to a successful Applicant. Usually, DOE will fund a DOE FFRDC contractor through the DOE field work proposal system and other FFRDC contractors through an interagency agreement with the sponsoring agency.

Responsibility. The Applicant, if successful, will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including, but not limited to, disputes and claims arising out of any agreement between the Applicant and the FFRDC.

D. Questions Regarding Eligibility

DOE will not make eligibility determinations for potential Applicants prior to the date on which applications to this FOA must be submitted. The decision whether to submit an application in response to this FOA lies solely with the Applicant.

SECTION IV – APPLICATION AND SUBMISSION INFORMATION

A. Overview of Application Submission Process

The application submission process includes the submittal of an application via EERE Exchange and optional Reply to Reviewer Comments. A control number will be issued when an Applicant begins the Exchange application process. This control number must be included with all Application documents. Each Application must be limited to a single FORGE site. Applicants may submit more than one Application proposing separate FORGE sites.

B. Address to Request Application Forms

The Application forms and instructions are available on EERE Exchange. To access these materials, go to <https://eere-Exchange.energy.gov/> and select the appropriate funding opportunity number.

Note: The maximum file size that can be uploaded to the EERE Exchange website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB but is still within the maximum page limit specified in the FOA it must be broken into parts and denoted to that effect. For example:

ControlNumber_LeadOrganization_Project_Part_1

ControlNumber_LeadOrganization_Project_Part_2, etc.

C. Content and Form of Application

You must complete the following application forms found on the EERE Exchange website at <https://eere-Exchange.energy.gov/>, in accordance with the instructions. Applicants will receive a Control Number once they “Apply to this FOA” on the EERE Exchange website and should include the Control Number in the file name, as indicated below.

1. Application Format Requirements

Applications must conform to the following format requirements:

- Each document must be submitted in the file format prescribed. If no file format is prescribed, an Adobe PDF file format is required.
- All Applications must be written in English.
- All pages must be formatted to fit on 8-1/2 by 11 inch paper with margins not less than one inch on every side. Use Times New Roman typeface, a black font color, and a font size not smaller than 11 point (except in figures and tables). A Symbol font may be used to insert Greek letters or special characters, but the font size requirement still applies.
- The Control Number must be prominently displayed on the upper right corner of the header of every page. Page numbers must be included in the footer of every page.
- Each section of the Application must conform to the page limits stated below. If Applicants exceed the maximum page lengths indicated below, evaluators will review only the authorized number of pages and disregard any additional pages.

2. Application Content Requirements

EERE will not review or consider noncompliant, incomplete, and/or nonresponsive Applications (see Section V.B.1. and V.B.2.)

In order to be responsive to this FOA, Applications must conform to the following requirements:

a. Technical Volume (Phase 1 through Phase 3 activities)

The Technical Volume must be submitted in Adobe PDF format. The Technical Volume must not exceed the specified page limits (see Technical Volume Format below for specific page limits relating to each section), single spaced, including cover page, table of contents, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right). EVALUATORS WILL REVIEW ONLY THE NUMBER OF PAGES SPECIFIED IN THE APPLICABLE SENTENCE. The font must not be smaller than Times New Roman 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application because the information contained in these sites will not be reviewed. See Section VIII.E. for instructions on how to mark proprietary application information. This volume must address the Merit Review Criteria as discussed in Section V.B.3.

Applicants must provide sufficient citations and references to the primary research literature to justify the claims and approaches made in the Technical Volume. References and citations are not included in the specified page limits and any cover pages or title pages inserted in the various sections of the Technical Volume for organizational purposes are not included in the specified page limits. DOE and reviewers may review primary research literature in order to evaluate applications. However, DOE and reviewers are under no obligation to review other sources referenced in the application (e.g., Internet websites).

General

The Technical Volume consists of a detailed discussion on: Site Suitability; Technical Approach; and Project Organization and Project Management Plan. Additional information including letters of commitment, and related publications/documentations/maps shall also be provided. Where applicable, page limits for each section are specified below. No material may be incorporated in any application by reference as a means to circumvent the page limitation. Illustrations shall be legible with all text in legible font. Pages shall be sequentially numbered.

Technical Volume Format

The content of the Technical Volume must address the Merit Review Criteria as discussed in Section V.B.3. of this FOA. The Applicant shall structure the Technical Volume in the format specified below including all required appendices to facilitate the review process.

TECHNICAL VOLUME FORMAT
Summary and Introduction – 2 page limit
Site Suitability – 15 page limit
Technical Approach (Statement of Project Objectives) – 10 page limit using

format contained in Attachment 5
Project Organization and Project Management Plan (PMP) – 20 page limit using format contained in Attachment 6
Appendix A - Initial Compliance Review
Appendix B - Site Characterization Data Inventory – use format contained in Attachment 3
Appendix C - Permitting Inventory – use format contained in Attachment 4
Appendix D - Team Letters of Commitment and Agreements

SUMMARY AND INTRODUCTION

Provide a brief introduction to the project, including a description of the proposed FORGE site and current site status including ownership. Applicants shall briefly introduce the main teaming partners, their roles, and a brief overview of the proposed management structure of the project. **The Summary and Introduction section of the Technical Volume shall not exceed two (2) pages.**

SITE SUITABILITY

Provide a description supporting the suitability and merit of the proposed FORGE site, including the following:

- Information that defines the area of operations where well drilling, stimulation and monitoring operations will occur as well as the anticipated areal and volumetric extent of potential subsurface impacts from increased formation pressure during the project operations. It is anticipated that one or more wells optimized to the in-situ state of stress (including highly deviated and/or fully horizontal wells) sufficient to meet DOE reservoir volume ($>1 \text{ km}^3$) and well productivity objectives will be drilled on the proposed site in Phase 3 of the project.
- Information supporting the availability of existing facilities, wells, equipment and infrastructure (e.g., roads, electric power/transmission lines) required to perform project tasks including a discussion on the state of access and current physical impediments that may impact meeting project objectives.
- Characteristics of the proposed site(s) and target formation(s) should be supplied in Appendix B (Site Characterization Data Inventory) to the Technical Volume, with content and format guided by the Example Site Characterization Data Inventory (Attachment 3). The associated discussion should include:
 - Identification of the depth range of the target formation for EGS reservoir creation with associated temperature and pressure data.
 - Description of the structure and stress regime, both site-specific and regional, and the potential impacts that these constraints will have on reservoir engineering.
 - Proof of well integrity for existing wells proposed for use in subsequent phases for monitoring, characterization, and/or EGS technology testing, including most recent cement bond, sonic, caliper, and televiewer logs as well as any leak off test data.
- Discussion regarding the status of site activities that have been conducted in support of permit applications and regulatory approval. This discussion should be consistent with data provided in Appendix C (Permitting Inventory) to the Technical Volume, with content and format guided by the Example Permitting Inventory (Attachment 4). Include documentation supporting work performed to

date on environmental assessment activities and include any available letters from agencies such as the U.S. Fish and Wildlife Service (USF&WL) and State Historic Preservation Office (SHPO) indicating the degree to which environmental reviews or other permitting activities have been initiated for the proposed site.

- Describe any anticipated constraints (e.g., endangered species, cultural resource issues, etc.) related to Phase 2 and 3 project-related requirements and large-scale operations, and how the Applicant will address these issues as it pertains to the NEPA process. This discussion should be consistent with data provided in Appendix C (Permitting Inventory) to the Technical Volume, with content and format guided by the Example Permitting Inventory (Attachment 4). The site must not have rivers, wetlands, lakes or densely populated areas that would significantly restrict access for operations or monitoring activities. The site must not be located over wetlands, sole source aquifers, or significant archeological sites that the injection or monitoring wells could penetrate.

The Site Suitability section of the Technical Volume shall not exceed fifteen (15) pages.

TECHNICAL APPROACH (STATEMENT OF PROJECT OBJECTIVES)

The SOPO should provide a clear and concise description of project objective(s) and should address the specific tasks/subtasks that will be conducted to meet these objectives. The Applicant should address all phases of the project with special attention to tasks/subtasks associated with Phase 1 objectives and deliverables following the specific SOPO format provided in Attachment 5 to this FOA. The Applicant should also address specific tasks/subtasks for Phase 2 and 3 of the project at a level appropriate to assess the Applicant's understanding of the necessary activities that must be carried out to ensure the GTO goals and objectives for the FORGE site are met. This includes a short overview (3-5 paragraphs) of the Applicant's proposed strategies for implementation (in Phases 2 and 3) of each required Plan (Preliminary Induced Seismicity Mitigation; Data Dissemination and Intellectual Property; Core Curation; Communications and Outreach; Environmental, Safety and Health; R&D Implementation Plan) developed in Phase 1.

During the Renewal Application process for down selection to Phase 2, the Applicant will have the opportunity to revise the SOPO, incorporating knowledge gained during Phase 1 and providing more detailed description of the tasks/subtasks necessary to carry out the remaining phases of the project. If the Applicant is selected for award negotiations, the DOE funding agreement will incorporate this SOPO that may be released to the public. It is therefore required that the SOPO shall not contain proprietary or confidential business information.

The format for the SOPO is provided as Attachment 5 to this FOA. The Technical Approach (SOPO) section of the Technical Volume shall not exceed ten (10) pages.

PROJECT ORGANIZATION AND PROJECT MANAGEMENT PLAN

The Applicant shall provide a detailed discussion on the following:

- Define the overall organizational structure (include graphical representation) planned for the project including key partnerships and teaming arrangements among participating organizations.
- Discuss key capabilities of each organization, their roles and responsibilities, and their level of participation demonstrating each organization's value added towards achieving the overall objective(s) of the proposed project.
- Discuss the project structure and management strategy among project team members as it pertains to procedures for resolving conflict of interest and intellectual property issues, and communication between team members, DOE, and any other involved Federal Agencies.

- Discuss the project structure and management strategy for integrating DOE participation in the decision making of scientific/technical responsibilities and direction.
- Discuss relevant prior or current corporate background and experience that supports the capabilities of the Applicant and its team members to permit, manage and operate FORGE and administer solicitations and awards for technology testing and evaluation in later phases of the project. The Applicant should demonstrate that the team members have experience in managing technical projects of similar nature and complexity, and the ability to successfully meet project objectives within scope, budget and schedule.
- Descriptions of knowledge, experience, adequacy, and degree of involvement of proposed key personnel. Include resumes in the Resume File described in Section IV.C. Content and Form of Application.
- Identification of potential real or perceived financial, schedule, technical, and management risks. The Applicant shall provide a discussion of how these risks will be addressed and strategies for mitigating them. At a minimum, Applicants must consider and discuss mitigation options for:
 - Potential long-term risks related to changes in policy (e.g. hydraulic fracturing guidance and endangered species management)
 - Well integrity issues prior to and during FORGE operations.
- The Applicant shall provide a table and justification for the estimated labor hours and labor categories (e.g., project manager, principal investigator, engineer, technician, scientist, clerical, etc.) required for each task and subtask under Phase 1 as outlined in the Statement of Project Objectives. The table and justification shall include labor hours and labor categories for any proposed subcontracting or consulting effort for each task and subtask. These categories should be easily cross-referenced with the key personnel, and should agree with labor hours identified in the separate "Budget Information" form submitted under Section IV.C.2.c.
- The Applicant shall provide a draft Project Management Plan (PMP). The purpose of the PMP is to provide for clear management and reporting, and to establish baseline budget and schedule for the project activities as outlined in the Statement of Project Objectives (SOPO). Note: *Upon award, the Recipient shall update and submit to DOE an updated PMP under Task 1 of the SOPO. The Recipient shall be required to update the PMP as necessary, at key phases of the project (e.g., new Phases/Budget Periods).*

The format for the PMP is provided as Attachment 6 to this FOA. The Project Organization and Project Management Plan section of the Technical Volume (which consists of both discussion and the draft PMP) shall not exceed twenty (20) pages.

TECHNICAL VOLUME APPENDICES:

APPENDIX A - INITIAL COMPLIANCE REVIEW

This appendix should specifically and clearly address how the Applicant fulfills the technical elements that comprise the Initial Compliance Review Criteria contained in Section V.B.2. of this FOA. The information provided in this appendix should be consistent with data provided in Appendix B Site Data Characterization Inventory and Appendix C Permitting Inventory. This appendix should, at a minimum, include a discussion and supporting evidence of the following:

- Discussion regarding the availability of the proposed site. Evidence of site availability may include ownership of the site, signed option to purchase the site from the site owner, letter of intent by the site owner to sell the site to the Applicant or provide the Applicant access to the site for the project.
- Discussion regarding the availability of rights to subsurface access. Evidence of subsurface access may include ownership of subsurface (i.e., mineral) rights, signed option to purchase subsurface rights from current owner, letter of intent by the current owner to sell the subsurface rights to the Applicant or provide the Applicant a lease agreement to access subsurface for the project.

- Discussion regarding the availability of access to water in quantities sufficient for day-to-day operations of FORGE and for anticipated well stimulation activities. Evidence of water availability includes municipal water use agreements, ownership of water rights (senior vs. junior), or signed option to purchase water rights, letter of intent by the current owner to sell water rights to the Applicant or provide the Applicant a lease agreement to utilize groundwater resources. If groundwater resource rights are available or are to be obtained, the Applicant must identify whether these will be senior or junior water rights and whether there are any impediments to continuous access to water over the duration of the project.
- Proposed site has temperature of 175-225°C at target depths. The Applicant shall provide the data necessary to support the temperature requirements (i.e., heat flow measurements, bottom hole temperature measurements, etc.)
- The Applicant shall provide documentation that a well or wells exist at the proposed site that provides confirmation of in-situ conditions at the target depth(s). Documented flow rates at target depth must not suggest that the target is a potential hydrothermal reservoir.
- The Applicant shall provide documentation showing that the proposed site is not located within an existing hydrothermal field or sedimentary basin. It may be located near an existing hydrothermal field.

The Initial Compliance Review discussion and supporting documentation shall be submitted as Appendix A to the Technical Volume.

APPENDIX B - SITE CHARACTERIZATION DATA INVENTORY

Provide site characterization data components and auxiliary information in accordance with the suggested format located in Attachment 3. In addition, provide any geologic site maps, site photographs, etc. necessary to support site characterization claims. Submission of all data contributing to the geologic model and any data contributing to the understanding of the proposed site, regardless of its proprietary status, data collected, or funding source, is encouraged.

The Site Characterization Data Inventory shall be submitted as Appendix B to the Technical Volume.

APPENDIX C – PERMITTING INVENTORY

Provide permitting data and potential NEPA issues identified through the review of existing databases in accordance with the suggested format located in Attachment 4. Applicants must provide map(s) indicating current surface and subsurface rights, lease boundaries, and the location of any national, state, tribal, or otherwise protected lands, and lands considered to have historical or archeological significance.

The Permitting Inventory shall be submitted as Appendix C to the Technical Volume.

APPENDIX D – TEAM LETTERS OF COMMITMENT AND AGREEMENTS

Provide signed agreements or letters from team members demonstrating that the proposed team members are fully committed to the project. Combine all individual Letter of Commitment into a single file.

The Team Letters of Commitment and Agreements shall be submitted as Appendix D to the Technical Volume.

b. SF-424 – Application for Federal Assistance (Phase 1 only)

Complete all required fields in accordance with the instructions on the form. The list of certifications and assurances in Field 21 can be found at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>, under Certifications and Assurances. NOTE: For the purposes of completing Block 18, Estimated Funding, the Applicant shall include only Phase I project costs (DOE share and Cost share [if proposed]).

c. Budget Information (SF-424A/PMC 123.1) (Phase 1only)

SF 424 A Excel, Budget Information - Non-Construction Programs File (Phase 1 only)

Applicants are required to complete the Budget Summary SF-424A Excel spreadsheet. This form is available on EERE Exchange at <https://eere-Exchange.energy.gov/>.

Applicants must also complete each tab of the Budget Justification PMC 123.1 for the project, including all work to be performed by the Recipient and its Subrecipients, and provide all requested documentation (e.g., a Federally-approved forward pricing rate agreement, Defense Contract Audit Agency or Government Audits and Reports, if available). Applicants should include costs associated with required annual audits and incurred costs proposals in their proposed budget documents.

Budget Justification File (Phase 1 only)

Budget justification information consists of Cost Detail information and associated Narrative Explanations. Cost Detail shall be submitted as described below. The Applicant shall provide a detailed budget for Phase 1. The proposed budget must include all costs (both DOE funded as well as non-DOE funded costs, i.e., cost sharing, if applicable). Narrative Explanations of budget items should be provided to supplement the Cost Detail Requirements described below. There is no specific format for the Narrative Explanations.

Cost Detail Requirements

The following cost detail is required for the proposed cost elements. Failure to provide the detailed cost information as described in the instructions will result in an incomplete application. Cost share is not required for Phase 1. However, if cost share is proposed, the Applicant shall stipulate in the application the source and amount of cost sharing and the value of third party in-kind contributions proposed to meet the requirement. Additionally, teaming members and subrecipients are also required to submit the information described below with their budgets using separate forms including Narrative Explanations.

Personnel (Direct Labor) -- In support of the proposed personnel costs, provide a schedule that identifies the labor hours, labor rates, and cost by labor classification for Phase 1. Also indicate the basis of the labor classification, number of hours, and labor rates. An example of the basis for the labor classification and number of hours could be past experience, engineering estimate, etc. An example of the basis for the labor rates could be actual rates for the individuals who will perform the work or an average labor rate for the labor classification or a departmental average rate.

Fringe Rate -- Provide the method used to calculate the proposed rate amount. If a fringe benefit rate has been negotiated with, or approved by, a Federal Government agency, provide a copy of the agreement. If no rate agreement exists, provide a detailed list of the fringe benefit expenses (e.g., payroll taxes, insurances, holiday and vacation pay, bonuses) and their associated costs. Identify the base for

allocating these fringe benefit expenses.

Travel -- For each proposed trip, provide the purpose, number of travelers, travel origin and destination, number of days, and a breakdown of estimated costs for airfare, lodging, meals, car rental, and incidentals. The basis for the airfare, lodging, meals, car rental, and incidentals must be provided, such as past trips, current quotations, current version of the Federal Travel regulations, etc.

Equipment -- Provide an itemized list of each piece of equipment, its unit cost, and the basis for estimating the cost, for example, vendor quotes, catalog prices, prior invoices, etc.

Supplies -- Provide an itemized list of supplies that have an acquisition cost greater than \$5,000; identify the quantity of each item, its unit cost, and the basis for estimating the cost, for example, vendor quotes, catalog prices, prior invoices, etc.

Subcontractors -- Provide an itemized list of required vendors, contractors and consultants supplying commercial supplies or services used to support the project that have an expected cost of greater than \$100,000. The support to justify vendor costs (in any amount) should provide the purpose for the products or services and a basis of the estimated costs (e.g. historical, vendor quote, etc.) that is considered sufficient for DOE evaluation.

d. Summary/Abstract for Public Release (Phase 1 only)

Applicants are required to submit a one-page summary/abstract of their project. The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the Applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). ***This document must not include any proprietary or sensitive business information as the Department may make it available to the public after the selections are made.*** The project summary must not exceed 1 page when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) with font not smaller than 11 point.

e. Resumes

Applicants are required to provide a resume for the PI and other Key Personnel. Each resume is limited to 3 pages maximum. Curriculum vitae will not be considered. Each resume must include:

- Education/training;
- Employment history;
- Awards and honors;
- Up to 10 peer-reviewed publications specifically related to the proposed project;
- Up to 10 other peer-reviewed publications demonstrating capabilities in the broad field; and
- Up to 10 non-peer reviewed publications and patents demonstrating capabilities in the broad field.

Please combine all individual resumes into a single file.

f. Subaward Budget Information (Phase 1 only)

Applicants must provide a separate budget, SF-424A and PMC 123.1 for each subawardee (including FFRDCs) that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). The SF424A provides columns for each individual budget-year as well as the cumulative project-budget. The total Phase 1 project cost, including cost share (if applicable) and Federal funding, must be represented in this document. These forms are available on EERE Exchange at <https://eere-Exchange.energy.gov/>.

g. Authorization for non-DOE/NNSA or DOE/NNSA FFRDCs (if applicable)

The Federal agency sponsoring the FFRDC contractor must authorize in writing the use of the FFRDC contractor on the proposed project and this authorization must be submitted with the application. The use of a FFRDC contractor must be consistent with the contractor's authority under its award. See Part III. C. 1. for authorization format.

h. Foreign Entity Waiver Request (if applicable)

As set forth in Section III.A.3, all prime recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a prime recipient, it must designate a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the prime recipient.

To request a waiver for this requirement, the Applicant must include the following information: entity name, country (or state) of incorporation, description of the work to be performed by that entity, and the location where the work will be performed. If the Applicant is seeking a waiver to have a foreign entity serve as the prime recipient, the Applicant must explain why it is necessary to have a foreign entity serve as the prime recipient. Waiver requests should explain how the waiver would further the purposes of this FOA and otherwise serve the interests of the Department of Energy. The Contracting Officer may require additional information before considering the waiver request. See Section IV.G.5. for additional information about obtaining a waiver.

i. Environmental Impact Questionnaire (Phase 1)

Applicants must complete the Environmental Impact Questionnaire found at <https://eere-Exchange.energy.gov/>.

j. SF-LLL Disclosure of Lobbying Activities

If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

k. Financial Management System

In order to qualify for a financial assistance award, the Applicant must demonstrate a financial management system that satisfies 10 CFR 600.121, 10 CFR 600.220, or 10 CFR 600.311, Standards for Financial Management Systems. The Applicant shall describe how its system meets the criteria outlined in the applicable 10 CFR

Section.

The major attribute of an acceptable financial management system is an accounting system that can accumulate, record, and report costs by project. Please include a signed letter certifying that you have reviewed and agree to comply with 10 CFR 600.121 or 10 CFR 600.311.

Summary of Required Forms and Files:

• Each Applicant must submit a Technical Volume in Adobe PDF. The Technical Volume shall include the following sections – see Section IV.C.2.a. - o Summary and Introduction (2 page limit) - o Site Suitability (15 page limit) - o Technical Approach (Statement of Project Objectives) (10 page limit) - o Project Organization and Project Management Plan (20 page limit) - o Appendices: ▪ Appendix A Initial Compliance Review ▪ Appendix B Site Characterization Data Inventory ▪ Appendix C Permitting Inventory ▪ Appendix D Team Letters of Commitment and Agreements • The Technical Volume must be accompanied by: - o SF 424 Application for Federal Assistance (no page limit, Adobe PDF) Phase 1 only – see Section IV.C.2.b. - o Budget Information (no page limit) Phase 1 only – See Section IV.C.2.c. ▪ SF 424A (Microsoft Excel format) ▪ Budget Justification PMC 123.1 (Microsoft Excel Format) - o Summary/Abstract for Public Release (1 page max, Adobe PDF) – See Section IV.C.2.d. - o Resumes (3 pages max per person, Adobe PDF) – See Section IV.C.2.e. - o Subaward Budget Information (no page limit) Phase 1 only – see Section IV.C.2.f. ▪ SF 424A (Microsoft Excel format) ▪ Budget Justification PMC 123.1 (Microsoft Excel Format) – required for subawards greater than \$100,000 – See Section IV.C.2.f. - o Authorization for non-DOE/NNSA or DOE/NNSA FFRDCs (if applicable) – See Section IV.C.2.g. - o Performance of Work in the United States / Eligibility Waiver Request (if applicable). See Section IV.G.5. - o Foreign Entity Waiver Request (if applicable) – See Section IV.C.2.h. - o Environmental Impact Questionnaire (use Environmental Impact Questionnaire found at https://eere-Exchange.energy.gov) Phase 1 only – See Section IV.C.2.i. - o SF LLL Disclosure of Lobbying Information – See	DUE DATE: 11/12/2014
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Section IV.C.2.j. o Financial Management System (1 page max, Adobe PDF) – See Section IV.C.2.k.	
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Note: The maximum file size that can be uploaded to the EERE Exchange website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB but is still within the maximum page limit specified in the FOA it must be broken into parts and denoted to that effect. EERE will not accept late submissions that resulted from technical difficulties due to uploading files that exceed 10MB.

D. Content and Form of Replies to Reviewer Comments

Written feedback on Applications is made available to Applicants before the submission deadline for Replies to Reviewer Comments. Applicants have a brief opportunity to prepare a short Reply to Reviewer Comments responding to one or more comments or supplementing their Application. Applicants must use this Reply to Reviewer Comments template to complete their Reply to Reviewer Comments.

Replies to Reviewer Comments must conform to the following requirements:

- The Reply to Reviewer Comments must be submitted in Adobe PDF format.
- The Reply to Reviewer Comments must be written in English.
- All pages must be formatted to fit on 8-1/2 by 11 inch paper with margins not less than one inch on every side. Use Times New Roman typeface, a black font color, and a font size no smaller than 11 point (except in figures and tables). A Symbol font may be used to insert Greek letters or special characters, but the font size requirement still applies.
- The Control Number must be prominently displayed on the upper right corner of the header of every page. Page numbers must be included in the footer of every page.

EERE will not review or consider replies to the notifications to applicants that their application was nonresponsive to the FOA and rejected from further review (see Section V.B.1. and V.B.2. and Section VI.A.1.)

EERE will review and consider each compliant, complete, and responsive Application, even if no Reply or a non-compliant Reply is submitted to Reviewer Comments.

Replies to Reviewer Comments must conform to the following content and form requirements, including maximum page lengths, described below. If a Reply to Reviewer Comments is more than two pages in length, EERE will review only the first two pages and disregard any additional pages.

SECTION	PAGE LIMIT	DESCRIPTION
Text	2 pages maximum	• Applicants may respond to one or more reviewer comments or supplement their Application.
Images	10 pages maximum	• Applicants may provide graphs, charts, or other data to respond to reviewer comments or supplement their Application.

E. Submissions from Successful Applicants

If selected for award, EERE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Documentation from the applicant and/or any team members that demonstrates the financial position and financial strength of the entity and addresses any specific issues that could impact operations over the course of the project
- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable

F. Intergovernmental Review

This program is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

G. Funding Restrictions

1. Allowable Costs

All expenditures must be allowable, allocable, and reasonable in accordance with the applicable Federal cost principles.

Refer to the applicable Federal cost principles referenced in: 2 CFR 220 for Educational Institutions; 2 CFR 225 for State, Local, and Indian Tribal Governments; 2 CFR 230 for Non Profit Organizations and FAR Part 31 for commercial organizations.

2. Pre-Award Costs

Recipients must obtain the prior approval of the Contracting Officer for any pre award costs incurred preceding the effective date of the award and no earlier than the selection date, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600.

National Environmental Policy Act (NEPA) Requirements. The federal funds distributed under this FOA are subject to NEPA. Applicants should carefully consider and should seek legal counsel or other expert advice before taking any action related to the proposed project that would have an adverse effect on the environment or limit the choice of reasonable alternatives prior to EERE completing the NEPA review process.

EERE does not guarantee or assume any obligation to reimburse costs where the recipient incurred the costs prior to receiving written authorization from the Contracting Officer. If the Applicant elects to undertake activities that may have an adverse effect on the environment or limit the choice of reasonable alternatives prior to receiving such written authorization from the Contracting Officer, the Applicant is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share. Likewise, if a project is selected for

negotiation of award, and the recipient elects to undertake activities that are not authorized for Federal funding by the Contracting Officer in advance of the NEPA determination, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share. Nothing contained in the pre-award cost reimbursement regulations or any pre-award costs approval letter from the Contracting Officer override these NEPA requirements to obtain the written authorization from the Contracting Officer regarding a final NEPA determination prior to taking any action that may have an adverse effect on the environment or limit the choice of reasonable alternatives.

3. Construction

EERE generally does not fund projects that involve major construction. Recipients are required to obtain written authorization from the Contracting Officer before incurring any major construction costs.

4. Foreign Travel

If international travel is proposed for your project, please note that your organization must comply with the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. 40118), commonly referred to as the “Fly America Act,” and implementing regulations at 41 CFR 301-10.131 through 301-10.143. The law and regulations require air transport of people or property to, from, between or within a country other than the United States, the cost of which is supported under this award, to be performed by or under a cost-sharing arrangement with a U.S. flag carrier, if service is available.

5. Performance of Work in the United States

EERE strongly encourages interdisciplinary and cross-sectoral collaboration spanning organizational and national boundaries. Such collaboration enables the achievement of scientific and technological outcomes that were previously viewed as extremely difficult, if not impossible.

EERE requires all work under EERE funding agreements to be performed in the United States – i.e., prime recipients must expend 100% of the direct labor cost in the United States.

Applicants and Recipients may request a waiver of this requirement. These requests should include the Countries in which work will be performed, description of work to be performed and the rationale for performing work overseas. If requesting a waiver, Applicants must include it in the Application. The DOE Contracting Officer has discretion to waive this requirement if he/she determines that it will further the purposes of this FOA and is otherwise in the interests of EERE. See Section III.A. for waiver request information.

6. Equipment and Supplies

To the greatest extent practicable, all equipment and products purchased with funds made available under this award should be American-made.

Property disposition will be required at the end of a project if the property is no longer used by the Recipient for the objectives of the project, and the fair market value of property exceeds \$5,000. The rules for property disposition are set forth in the applicable sections of 10 CFR Part 600.

7. Conference Spending (April 2013)

The recipient shall not expend funds for the purpose of defraying the cost to the United States Government of a conference [described in subsection (c) of the Consolidated and Further Continuing Appropriations Act, 2013] that was more than \$20,000, or circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to the Inspector General or senior ethics official for any entity without an Inspector General, of the date, location, and number of employees attending such conference that is not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded.

H. Teaming Partner List

In order to facilitate the formation of new project teams, a Teaming Partner List will be made available through the FOA Question and Answer page on the EERE eXCHANGE website at <https://eere-Exchange.energy.gov>.

Any organization that would like to be included on the Teaming Partner List should submit the following information to DE-FOA-0000890-FORGE@netl.doe.gov:

- Organization Name
- Organization Type
- Contact Name/Phone Number/Email
- Area of Technical Expertise
- Brief Description of Capabilities (not to exceed 500 characters)

Applicants who submit this information are consenting to the publication of the above-referenced information. By facilitating this Teaming Partner List, EERE does not endorse or otherwise evaluate the qualifications of the entities that identify themselves for placement on the Teaming Partner List. In addition, citations to Web sites external to EERE do not constitute EERE endorsement of the sponsoring organizations or their programs or products. Furthermore, EERE is not responsible for the content of these Web sites.

SECTION V - APPLICATION REVIEW INFORMATION

A. Overview of Application Review Process

The Application Review Process will be carried out through the following multiple steps:

1. Initial Administrative Compliance Review of the Applications
2. Initial Technical Compliance Review of the Applications
3. Technical Merit Review of the Applications
4. Review of Applicant's Replies to Reviewer Comments (If submitted)
5. Selection Process

B. Review Process

1. Initial Administrative Compliance Review

- The Applicant meets the eligibility requirements in Section III;
- The Application complies with the content and form requirements in Section IV.C.; and
- The Applicant entered all required information necessary for a meaningful review, successfully uploaded all required documents, and clicked the "Submit" button in EERE Exchange by the deadline stated in the FOA.

Applications that pass the Initial Administrative Compliance Review will then be forwarded for the Initial Technical Compliance Review.

2. Initial Technical Compliance Review

In addition to the Initial Administrative Compliance Review, applications **MUST** meet the following technical requirements to fully satisfy the Initial Review and be considered complete and responsive to the FOA. Only complete and responsive applications are forwarded for a comprehensive Technical Merit Review as described in Part V.B.2 of this announcement. If any of these items are not included in the application, it will **NOT** satisfy the Initial Review, the application will be considered incomplete and non-responsive and will not be forwarded for comprehensive Technical Merit Review. Applications not forwarded for or receiving a comprehensive Technical Merit Review are not eligible for award negotiations.

This information will be submitted by the Applicant in Appendix A to the Technical Volume of the Application.

- Sufficient legal documentation demonstrating that the proposed site is located within an area of an existing geothermal lease.
- Sufficient legal documentation to demonstrate possession of the legal surface and subsurface rights necessary for FORGE field operations, including, but not limited to, well drilling and stimulation,

environmental monitoring, and installation of required site infrastructure from the time of application through the duration of all anticipated phases of the project.²

- Sufficient legal documentation to demonstrate water availability/rights for FORGE field operations from the time of application through the duration of all anticipated phases of the project.³
- Evidence (e.g., bottomhole temperature measurements) that the proposed site has temperature of 175-225°C at target depths.
- Documentation of an existing well or wells at the proposed site that provides confirmation of in-situ conditions at the target depth(s) and evidence (from existing well flow data) that target formation is not a hydrothermal reservoir.
- Documentation showing that the proposed site is not located within an existing hydrothermal field or sedimentary basin. It may be located near an existing hydrothermal field.

EERE will not review or consider noncompliant, incomplete, or non-responsive Applications, including Applications submitted through other means and Applications submitted after the applicable deadline. An Application is incomplete if it does not include required information and documents, such as Forms SF-424 and 424A. EERE will not extend the submission deadline for Applicants that fail to submit required information and documents due to server/connection congestion.

3. Technical Merit Review

All applications that meet the requirements of the Initial Review (both Administrative and Technical) are deemed responsive to the FOA and will be forwarded for comprehensive Technical Merit Review in accordance with EERE's Notice of Objective Merit Review Procedure (76 Fed. Reg. 17846, March 31, 2011) and the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance", which is available at: <http://energy.gov/sites/prod/files/meritrev.pdf>. All forwarded Applications will be evaluated in accordance with the Technical Merit Review Criteria consisting of three main technical evaluation criteria, each with numerous subcriteria. Items listed within each criterion should not be considered to be equally weighted and are not listed in order of priority. The importance of the main technical evaluation criteria is weighted, totaling 100%, as outlined in the criteria below.

Criterion 1: Site Suitability (Weight: 40%)

- Adequacy and suitability of the geographic area of the FORGE site for supporting proposed operations, including site boundaries on the surface and the expected volumetric extent of subsurface activities relative to the targeted geologic formation(s) and key bounding geologic elements (inclusive of drilling and stimulation of wells).

² For projects on federal land, legal documentation may include a BLM lease, BLM site license, BLM exploration permit, BLM drilling permit, and a BLM utilization permit. For projects on private/state land, legal documentation may include: a deed or lease for the mineral/water/geothermal rights (as defined in that state), a similar document showing surface rights, and drilling & operating permits. Evidence of subsurface access may include ownership of subsurface (i.e., mineral) rights, signed option to purchase subsurface rights from current owner, letter of intent by the current owner to sell the subsurface rights to the Applicant or provide the Applicant a lease agreement to access subsurface for the project.

³ Evidence of water availability include municipal water use agreements, ownership of water rights (senior vs. junior), or signed option to purchase water rights, letter of intent by the current owner to sell water rights to the Applicant or provide the Applicant a lease agreement to utilize groundwater resources. If groundwater resource rights are available or are to be obtained, the Applicant must identify whether these will be senior or junior water rights and whether there are any impediments to continuous access to water over the duration of the project.

- Adequacy, availability, and accessibility of existing facilities, equipment and infrastructure (including wells) required to perform project tasks and meet the project objectives.
- Quality of existing site characterization data for demonstrating suitability of key physical site properties including information from existing wellbore(s) (drilling records, logs, etc.), geophysical surveys, fluid sampling, existing geologic models, and historical usage records as detailed in Appendix B Site Characterization Data Inventory.
- Degree to which Applicant has initiated the environmental review activities as described in Appendix C Permitting Inventory, including coordination with SHPO, USF&WL, BLM or other federal or state regulatory agencies, and interested stakeholders designed to identify potential project-related environmental risks and impacts.
- Significance of the identified potential environmental issues and soundness of the Applicant's proposed approach to adequately address and mitigate potential NEPA constraints, risks and impacts.

Criterion 2: Technical Approach (Weight 35%)

- Quality, thoroughness, and clarity of the Applicant's initial strategies outlining preliminary content for each of the following required Plans, to be fully developed during Phase 1:
 - Data Dissemination and Intellectual Property Plan
 - Core Curation Plan
 - Communications and Outreach Plan (including Stakeholder engagement)
 - Research and Development Implementation Plan
 - Preliminary Induced Seismicity Mitigation Plan
 - Environmental, Safety and Health Plan
- Appropriateness, clarity, and completeness of the proposed Statement of Project Objectives including the adequacy, feasibility, and logic of the Applicant's approach for achieving the stated project objectives and decision point criteria and including the proposed strategies for Phase 2 and 3.

Criterion 3: Project Organization and Management (Weight: 25%)

- Clear demonstration that the capabilities, roles, responsibilities, and level of participation (as evidenced by letters of commitment) of each project participant provides added value towards making scientific/technical decisions to achieve GTO goals and the FOA objectives.
- Adequacy of the proposed organizational structure and management strategy as it pertains to key partnerships, procedures for resolving conflict of interest and intellectual property issues, and communication between team members, DOE and others.
- Adequacy of the proposed organizational structure and management strategy as it pertains to the integration of DOE in implementing scientific and technical direction.
- Demonstrated ability of the Applicant and participating team members to successfully manage and complete energy-related projects of similar size and complexity within original scope, budget, and schedule.
- As it pertains to the project roles identified for key personnel, the strength and adequacy of their past background and experience to successfully perform the assigned functions.
- Clear identification of potential or perceived project risks (including technical, management, process, schedule, and cost), and the adequacy of the mitigation strategies associated with those risks.
- Sound justification and adequacy of labor categories and associated labor hours to carry out proposed Phase 1 activities.
- The adequacy of the proposed PMP including project budget justification, schedule, costing profile, and the soundness of critical path milestones and their associated verification methods to meet project objectives.

4. Review of Applicant's Reply to Reviewer Comments

Once EERE has completed its review of all compliant and responsive Applications, Reviewer Comments on compliant and responsive Applications will be made available to Applicants via EERE Exchange. Each Applicant will have access only to comments on its own application(s). Applicants may submit an optional Reply to Reviewer Comments. The originally assigned Control Number must be marked in the header of the Reply. Section IV.D. of the FOA provides instructions on submitting a Reply to Reviewer Comments. Applicants will have 4 days from the time reviewer comments are posted to prepare and submit a Reply to the Reviewer Comments. The Reply to Reviewer Comments consists of up to two pages of text and up to one page of visual displays of data. EERE will not review any information provided beyond the stated page limits.

Submitting a Reply to Reviewer Comments is optional.

EERE has NOT established separate criteria to evaluate Replies to Reviewer Comments. Instead, replies to Reviewer Comments are evaluated as an extension of the Application using the established Merit Review Criteria as outlined in Technical Merit Review of Applications outlined above.

EERE will not review Replies to Reviewer Comments submitted through other means or Replies submitted after the applicable deadline.

5. Selection Process

The Selection Official may consider the merit review recommendation, program policy factors, and the amount of funds available.

Program Policy Factors

- The degree to which the proposed project, including proposed cost shares, optimizes the use of available DOE funding to achieve programmatic objectives;
- The level of industry involvement and demonstrated ability to advance EGS technology;
- Degree of environmental risks associated with the project;
- The degree to which the proposed project directly addresses DOE's statutory mission and strategic goals;
- The quantity and availability of project and site data that the Applicant commits to sharing with the broader community through the GDR, and ultimately the FORGE Data System/Node, regardless of its proprietary status, date collected, or funding source;
- Proximity of the site to an existing hydrothermal field; and
- Diversity of site geology with respect to GTO's existing EGS portfolio, and broader applicability of the site's geologic setting for reproducibility.

Government Discussions with Applicant

The Government may enter into discussions with a selected Applicant for any reason deemed necessary, including, but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR Part 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the Applicant.

C. Anticipated Notice of Selection and Award Dates

EERE anticipates notifying Applicants selected for award by March 2015 and making awards by June 2015.

SECTION VI - AWARD ADMINISTRATION INFORMATION

A. Award Notices

1. Rejected Submissions

Incomplete and nonresponsive Applications will not be forwarded for comprehensive Technical Merit Review and will not be considered for award negotiations.

The Contracting Officer will send a notification letter using the designated email address to the technical and administrative points of contact designated by the Applicant in EERE Exchange. The notification letter will state the basis upon which the Application was rejected. Replies to the notification letter will not be accepted or reviewed.

2. Notification of Reviewer Comments

Applicants with projects that were forwarded for comprehensive Technical Merit Review will be contacted using the email addresses designated for the technical and administrative points of contact by the Applicant in EERE Exchange when reviewer comments are available for their review and reply.

3. Selection Notifications

EERE will promptly notify Applicants of the determination on the Application. EERE will send a notification letter using the designated email address to the technical and administrative points of contact designated by the Applicant in EERE Exchange.

a. Successful Applicants

A notification letter selecting an Application for award negotiations does not authorize the Applicant to commence performance of the project. EERE **selects Applications for award negotiations, not for award**. Applicants do not receive an award until award negotiations are complete and the Contracting Officer executes the funding agreement.

Please refer to Section IV.G.2. for guidance on pre-award costs.

b. Postponed Selection Determinations

A notification letter postponing a final selection determination until a later date does not authorize the Applicant to commence performance of the project. EERE may ultimately determine to select or not select the Application for award negotiations.

c. Unsuccessful Applicants

EERE shall promptly notify each Applicant in writing whose application was not selected for award or whose application cannot be funded because of the unavailability of appropriated funds. If the application was not selected, the written notice shall explain why the application was not selected.

4. Notice of Award

A Financial Assistance Award or Assistance Agreement issued by the Contracting Officer is the authorizing award document. It normally includes, either as an attachment or by reference: (1) Assistance Agreement Form; (2) Special Terms and Conditions; (3) Intellectual Property Provisions; (4) Statement of Project Objectives; (5) Reporting Checklist and Instructions; (6) Budget Information; (7) National Policy Assurances; (8) Applicable program regulations, if any; (9) Application as approved by DOE; and (10) DOE assistance regulations at 10 CFR

part 600.

For grants and cooperative agreements made to universities, non-profits and other entities subject to OMB Circular A-110, the Award also includes the Research Terms and Conditions and the DOE Agency Specific Requirements located at: <http://www.nsf.gov/awards/managing/rtc.jsp>.

B. Administrative Requirements, National Policy Requirements, and Applicant Representations and Certifications

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in Title 10 CFR Part 600. Grants and cooperative agreements made to universities, non-profits and other entities subject to Title 10 CFR Part 600 are subject to the Research Terms and Conditions located on the National Science Foundation web site at: <http://www.nsf.gov/awards/managing/rtc.jsp>.

2. DUNS and SAM Requirements

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR, Part 25 (See: <http://ecfr.gpoaccess.gov>). Prime awardees must keep their data at the System for Award Management (SAM) current at <https://www.sam.gov>. SAM is the government-wide system that replaced the CCR. If you had an active registration in the CCR, you have an active registration in SAM. Subawardees at all tiers must obtain DUNS numbers and provide the DUNS number to the prime awardee before the subaward can be issued.

3. Subaward and Executive Reporting

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR, Part 170. (See: <http://ecfr.gpoaccess.gov>). Prime awardees must register with the new FSRS database and report the required data on their first tier subawardees. Prime awardees must report the executive compensation for their own executives as part of their registration profile in the System for Award Management (SAM).

4. Special Terms and Conditions, National Policy Requirements, and Applicant Representations and Certifications

a. The EERE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located as an Attachment to this FOA.

b. The National Policy Assurances To Be Incorporated as Award Terms are located at:
<http://energy.gov/management/downloads/national-policy-assurances-be-incorporated-award-terms>

c. Applicant Representations and Certifications

Corporate Felony Conviction and Federal Tax Liability Representations (March 2012)

By submitting an application in response to this FOA the Applicant represents that:

- (1) It is **not** a corporation that has been convicted (or had an officer or agent of such corporation acting on behalf of the corporation convicted) of a felony criminal violation under any Federal law within the preceding 24 months,
- (2) **No** officer or agent of the corporation have been convicted of a felony criminal violation for an offence arising out of actions for or on behalf of the corporation under Federal law in the past 24

months,

- (3) It is **not** a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

For purposes of these representations the following definitions apply:

A Corporation includes any entity that has filed articles of incorporation in any of the 50 states, the District of Columbia, or the various territories of the United States [but not foreign corporations]. It includes both for-profit and non-profit organizations.

d. Statement of Substantial Involvement

DOE will be substantially involved with the Recipient during the performance of the resultant cooperative agreement. DOE shall have a substantial role in project decision-making, including participation in decisions related to the technical, programmatic, and/or financial aspects of the project and/or operation of the FORGE.

Recipient's responsibilities will include:

- Performing the activities described in FORGE Statement of Project Objectives (SOPO) and the Project Management Plan (PMP), including providing the required personnel, facilities, equipment, supplies and services;
- Managing and controlling project activities in accordance with established processes and procedures to ensure tasks and subtasks are completed within schedule and budget constraints defined by the current PMP;
- Notifying DOE in a timely manner of issues that arise during the course of the project that jeopardize the technical, schedule and/or budget objectives;
- Coordinating project activities with external organizations, including subrecipients, consultants, key personnel supported by DOE outside of the scope of this funding announcement, and DOE M&O contractors (as applicable), to ensure effective integration of all work elements;
- Defining approaches and plans, submitting the plans to the DOE Project Officer for review, and incorporating DOE comments;
- Publication of all non-proprietary data for the geothermal community in a timely manner;
- Attending annual program review meetings and reporting project status, submitting required reports, and presenting project results at appropriate technical conferences; and
- Facilitating DOE evaluation of project work on the premises of the Recipient or a subrecipient.

DOE responsibilities will include:

- Collaborating with the Recipient regarding FORGE activities and recommending alternate approaches or delaying/shifting work emphasis, if needed, to adequately address critical project and/or programmatic issues;
- Review and concur with ongoing technical performance to ensure that technical progress has been achieved within sub-phases before work can proceed to subsequent phases;
- Appointment of members to review teams (in an amount of at least 30% representation) associated with the project (e.g., Site Management Team, Science and Technology Analysis Team, or other equivalent bodies) and participation in the formation of the consensus which will

determine the direction and scope of the key development activities. In the event a consensus cannot be reached, the matter will be referred to the Office Director of GTO;

- Collaboration with the Recipient in the allocation of funds budgeted as work progresses and as funding needs may change between the different projects undertaken;
- Participation with the Recipient in the reviews of contractor activities and reports;
- Review and resolution of actual and perceived Conflict of Interest issues; and
- Serving as scientific/technical liaison between Recipient and other program or industry staff.

Refer to 10 CFR 600.5(b) for additional information describing substantial involvement: *“DOE has the right to intervene in the conduct or performance of project activities for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.”*

e. Environmental Impact Questionnaire

EERE is required to evaluate the potential environmental impact of projects that it is considering for funding. In particular, EERE must determine before funding a project whether the project qualifies for a categorical exclusion under 10 C.F.R. § 1021.410 or whether it requires further environmental review (i.e., an environmental assessment or an environmental impact statement). In limited circumstances, EERE may fund preliminary activities associated with the proposed project (e.g., preliminary design, environmental studies, preparation of documentation for the environmental review process, and permitting). However, such preliminary activities cannot significantly impact the environment and cannot constitute an irreversible or irretrievable commitment by EERE.

Recipients are required to complete the Environmental Impact Questionnaire for Phase 1 and for the project as a whole, including all work to be performed by the Recipient and its Subrecipients and Contractors. Recipients may not limit their responses to work performed by the Recipient.

In completing the Environmental Impact Questionnaire, Recipients must provide specific information regarding the nature of the Project Team’s proposed action, including information on their size, operations, and the types and quantities of air emissions, wastewater discharges, solid wastes, land disturbances, etc. Recipients should identify the location(s) of the proposed action and specifically describe the activities that would occur at each location.

Upon request, the Recipient or Subrecipients are required to provide additional information to the EERE NEPA Compliance Officer.

f. U.S. Manufacturing Commitments

EERE requires subject inventions (i.e., inventions conceived or first actually reduced to practice under EERE awards) to be substantially manufactured in the United States by Project Teams and their licensees, as described below. The Applicant may request a modification or waiver of the U.S. Manufacturing Requirement through the Business Assurances Form submitted with the Application.

a. SMALL BUSINESSES, EDUCATIONAL INSTITUTIONS AND NONPROFITS

Small businesses (including Small Business Concerns), domestic educational institutions, and nonprofits that are Recipients or Subrecipients under EERE funding agreements must require their exclusive licensees to substantially manufacture the following products in the United States for any use or sale in the United States: (1) articles embodying subject inventions, and (2) articles produced through the use of subject invention(s). This

requirement does not apply to articles that are manufactured for use or sale overseas.

Small businesses, domestic educational institutions and nonprofits must require their assignees to apply the same U.S. Manufacturing requirements to their exclusive licensees.

These U.S. Manufacturing requirements do not apply to nonexclusive licensees.

b. LARGE BUSINESSES, FOREIGN ENTITIES, and State and Local Government Entities

Large businesses and foreign entities that are Recipients or Subrecipients under EERE funding agreements that take title to subject inventions through a patent waiver are required to substantially manufacture the following products in the United States: (1) products embodying subject inventions, and (2) products produced through the use of subject invention(s). This requirement applies to products that are manufactured for use or sale in the United States and overseas.

Large businesses and foreign entities must apply the same U.S. Manufacturing requirements to their assignees, licensees, and entities acquiring a controlling interest in the large business or foreign entity. Large businesses and foreign entities must require their assignees and entities acquiring a controlling interest in the large business or foreign entity to apply the same U.S. Manufacturing requirements to their licensees.

c. FFRDCs

DOE FFRDCs are subject to the U.S. Manufacturing requirements set forth in their Management and Operating Contracts. All other FFRDCs are subject to the U.S. Manufacturing requirements as set forth above, based on their size and for-profit status.

g. Subject Invention Utilization Reporting

To ensure that Prime Recipients and Subrecipients holding title to subject inventions are taking the appropriate steps to commercialize subject inventions, EERE requires that each Recipient holding title to a subject invention submit annual reports for 10 years from the date the subject invention was disclosed to EERE on the utilization of the subject invention and efforts made by Recipient or their licensees or assignees to stimulate such utilization. The reports must include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Prime Recipient, and such other data and information as EERE may specify.

h. Intellectual Property Provisions

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>

i. Foreign National Involvement

All Applicants selected for an award resulting from this FOA may be required to provide information to the Department of Energy (DOE) in order to facilitate our responsibilities associated with foreign national access to DOE sites, information, technologies, and equipment. Foreign national is defined as any person who was born outside the jurisdiction of the United States, is a citizen of a foreign government, and has not been naturalized under U.S. law. If the selected Applicant, including

subrecipients/contractors, anticipates utilizing a foreign national person in the performance of an award, the selected Applicant may be responsible for providing to the DOE representative specific information of the foreign national(s) to satisfy compliance with all of the requirements for access approval.

C. Reporting

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement.

SECTION VII - QUESTIONS/AGENCY CONTACTS

A. Questions

Upon the issuance of a FOA, EERE personnel are prohibited from communicating (in writing or otherwise) with Applicants regarding the FOA except through the established question and answer process as described below. Specifically, questions regarding the content of this FOA must be submitted to: DE-FOA-0000890-FORGE@netl.doe.gov not later than 3 business days prior to the application due date.

All questions and answers related to this FOA will be posted on EERE Exchange at: <https://eere-exchange.energy.gov/>. **Please note that you must first select this specific FOA Number in order to view the questions and answers specific to this FOA.** EERE will attempt to respond to a question within 3 business days, unless a similar question and answer has already been posted on the website.

Questions related to the registration process and use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov

B. Agency Contacts

Name: Sue Miltenberger, Contract Specialist

E-mail: DE-FOA-0000890-FORGE@netl.doe.gov

SECTION VIII - OTHER INFORMATION

A. Amendments

Amendments to this FOA will be posted on the EERE Exchange web site and the Grants.gov system. However, you will only receive an email when an amendment for the FOA is posted on these sites if you register for email notifications for this FOA in Grants.gov and EERE Exchange. EERE recommends that you register as soon after the release of the FOA as possible to ensure you receive timely notice of any amendments or other FOAs.

B. Informational Webinars

EERE will conduct one informational webinar during the FOA process. The webinar will be held after the initial FOA release.

The purpose of the webinar will be to give applicants a chance to ask questions about the FOA process generally. Attendance is not mandatory and will not positively or negatively impact the overall review of any Applicant submissions. As the webinar will be open to all Applicants who wish to participate, Applicants should refrain from asking questions or communicating information that would reveal confidential and/or proprietary information specific to their project. The date for the webinar can be found on the cover page of the FOA.

C. Government Right to Reject or Negotiate

EERE reserves the right, without qualification, to reject any or all applications received in response to this FOA and to select any application, in whole or in part, as a basis for negotiation and/or award.

D. Commitment of Public Funds

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

Funding for all awards and future budget periods are contingent upon the availability of funds appropriate by Congress for the purpose of this program and the availability of future-year budget authority.

E. Proprietary Application Information

EERE will use data and other information contained in applications strictly for evaluation purposes. Applicants should not include confidential, proprietary, or privileged information in their applications unless such information is necessary to convey an understanding of the proposed project.

Applications containing confidential, proprietary, or privileged information must be 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. Government is not liable for the disclosure or use of unmarked information, and may use or disclose such information for any purpose.

The cover sheet of the application must be marked as follows and identify the specific pages containing confidential, proprietary, or privileged information:

“Notice of Restriction on Disclosure and Use of Data:

Pages [list applicable pages] of this document may contain confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter

and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source.

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.”

In addition, every line and paragraph containing proprietary, privileged, or trade secret information must be clearly marked with double brackets or highlighting.

F. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The Applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

G. Notice Regarding Eligible/Ineligible Activities

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

H. Notice of Right to Conduct a Review of Financial Capability

DOE reserves the right to conduct an independent third party review of financial capability for Applicants that are selected for negotiation of award (including personal credit information of principal(s) of a small business if there is insufficient information to determine financial capability of the organization).

I. Notice of Potential Disclosure under Freedom of Information Act

Applicants should be advised that identifying information regarding all Applicants, including Applicant names and/or points of contact, may be subject to public disclosure under the Freedom of Information Act, whether or not such Applicants are selected for negotiation of award.

J. Requirement for Full and Complete Disclosure

Applicants are required to make a full and complete disclosure of the information requested in the Other Sources of Funding Disclosure form. Disclosure of the requested information is mandatory. Any failure to make a full and complete disclosure of the requested information may result in:

- The rejection of an Application and/or Reply to Reviewer Comments;
- The termination of award negotiations;
- The modification, suspension, and/or termination of a funding agreement;
- The initiation of debarment proceedings, debarment, and/or a declaration of ineligibility for receipt of Federal contracts, subcontracts, and financial assistance and benefits; and
- Civil and/or criminal penalties.

K. Retention of Submissions

EERE expects to retain copies of all Applications, Replies to Reviewer Comments, and other submissions. No submissions will be returned. By applying to EERE for funding, Applicants consent to EERE's retention of their submissions.

L. Title to Subject Inventions

Ownership of subject inventions (inventions conceived or first actually reduced to practice) is governed pursuant to the authorities listed below.

- Domestic Small Businesses, Educational Institutions, and Nonprofits: Under the Bayh-Dole Act (35 U.S.C. § 200 et seq.), domestic small businesses, educational institutions, and nonprofits may elect to retain title to their subject inventions.
- All other parties: The Federal Non Nuclear Energy Act of 1974, 42 U.S.C. 5908, provides that the Government obtains title to new subject inventions unless a waiver is granted (*see below*).
- Class Waiver: Under 42 U.S.C. § 5908, title to subject inventions vests in the U.S. Government and large businesses and foreign entities do not have the automatic right to elect to retain title to subject inventions. However, EERE has issued "a class patent waiver" under which large businesses and foreign entities that meet certain stated requirements may elect to retain title to their subject inventions. If a large business or foreign entity elects to retain title to its subject invention, it must file a patent application.
- Advance and Identified Waivers: Applicants that do not participate in the class patent waiver may request a patent waiver that will cover subject inventions that may be invented under the award, in advance of or within 30 days after the effective date of the award. Even if an advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver for identified inventions, i.e., individual subject inventions that are disclosed to DOE within the timeframes set forth in the award's intellectual property terms and conditions. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

M. Government Rights in Subject Inventions

Where Recipients and Subrecipients retain title to subject inventions, the U.S. Government retains certain rights.

N. Government Use License

The U.S. Government retains a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world. This license extends to contractors doing work on behalf of the Government.

O. March-In Rights

The U.S. Government retains march-in rights with respect to all subject inventions. Through "march-in rights," the Government may require a Recipient or Subrecipient who has elected to retain title to a subject invention (or their assignees or exclusive licensees), to grant a license for use of the invention. In addition, the Government may grant licenses for use of the subject invention when Recipients, Subrecipients, or their assignees and exclusive licensees refuse to do so.

The U.S. Government may exercise its march-in rights if it determines that such action is necessary under any of the four following conditions:

- The owner or licensee has not taken or is not expected to take effective steps to achieve practical application of the invention within a reasonable time;

- The owner or licensee has not taken action to alleviate health or safety needs in a reasonably satisfied manner;
- The owner has not met public use requirements specified by Federal statutes in a reasonably satisfied manner; or
- The U.S. Manufacturing requirement has not been met.

P. Rights in Technical Data

Data rights differ based on whether data is first produced under an award or instead was developed at private expense outside the award.

- “Limited Rights Data”: The U.S. Government will not normally require delivery of confidential or trade secret-type technical data developed solely at private expense prior to issuance of an award, except as necessary to monitor technical progress and evaluate the potential of proposed technologies to reach specific technical and cost metrics.
- Generated Data: The U.S. Government normally retains unlimited rights in technical data produced under Government financial assistance awards, including the right to distribute to the public. One exception to the foregoing is that invention disclosures may be protected from public disclosure for a reasonable time in order to allow for filing a patent application.

Due to the fact that the overarching goal of FORGE is for the operation of a testing facility, the clause at DEAR 952.227-78 – RIGHTS IN TECHNICAL DATA - FACILITY shall be incorporated into all cooperative agreements upon the authorization to proceed into Phase 2. This data clause does not provide for the protection of data first generated under the cooperative agreement. Thus, for each project that continues into Phase 2 and beyond, a listing of generated data that will not be required to be delivered to the Government shall be negotiated. Data to be included on this list will be of the type that would be trade secret or confidential if developed at private expense. Along with this data list, a listing of the minimum data to be delivered with unlimited rights shall be negotiated. Both listings shall be incorporated into the cooperative agreement via a modification for each sub-project to be performed. There shall also be included provisions for the delivery of limited rights data to the Government (in addition to the standard Government inspection rights) and a license in such data for the Government to use for Government purposes.

Q. Copyright

The Recipient and Subrecipients may assert copyright in copyrightable data, such as software, first produced under the award without EERE approval. When copyright is asserted, the Government retains a paid-up nonexclusive, irrevocable worldwide license to reproduce, prepare derivative works, distribute copies to the public, and to perform publicly and display publicly the copyrighted work. This license extends to contractors and others doing work on behalf of the Government.

R. Protected Personally Identifiable Information

In responding to this FOA, Applicants must ensure that Protected Personally Identifiable Information (PII) is not included in the following documents: Project Abstract, Project Narrative, Biographical Sketches, Budget or Budget Justification. These documents will be used by the Merit Review Committee in the review process to evaluate each application. PII is defined by the Office of Management and Budget (OMB) and DOE as:

Any information about an individual maintained by an agency, including, but not limited to, education, financial transactions, medical history, and criminal or employment history and information that can be used to distinguish or trace an individual’s identity, such as their name, social security number, date and place of birth, mother’s

maiden name, biometric records, etc., including any other personal information that is linked or linkable to an individual.

This definition of PII can be further defined as: (1) Public PII and (2) Protected PII.

Public PII: PII found in public sources such as telephone books, public websites, business cards, university listing, etc. Public PII includes first and last name, address, work telephone number, email address, home telephone number, and general education credentials.

Protected PII: PII that requires enhanced protection. This information includes data that if compromised could cause harm to an individual such as identity theft.

Listed below are examples of Protected PII that Applicants must not include in the files listed above to be evaluated by the Merit Review Committee.

- Social Security Numbers in any form
- Place of Birth associated with an individual
- Date of Birth associated with an individual
- Mother's maiden name associated with an individual
- Biometric record associated with an individual
- Fingerprint
- Iris scan
- DNA
- Medical history information associated with an individual
- Medical conditions, including history of disease
- Metric information, e.g. weight, height, blood pressure
- Criminal history associated with an individual
- Employment history and other employment information associated with an individual
- Ratings
- Disciplinary actions
- Performance elements and standards (or work expectations) are PII when they are so intertwined with performance appraisals that their disclosure would reveal an individual's performance appraisal
- Financial information associated with an individual
- Credit card numbers
- Bank account numbers
- Security clearance history or related information (not including actual clearances held)

Listed below are examples of Public PII that Applicants may include in the files listed above to be evaluated by the Merit Review Committee:

- Phone numbers (work, home, cell)
- Street addresses (work and personal)
- Email addresses (work and personal)
- Digital pictures
- Medical information included in a health or safety report
- Employment information that is not PII even when associated with a name
- Resumes, unless they include a Social Security Number
- Present and past position titles and occupational series
- Present and past grades
- Present and past annual salary rates (including performance awards or bonuses, incentive awards, merit pay amount, Meritorious or Distinguished Executive Ranks, and allowances and differentials)
- Present and past duty stations and organization of assignment (includes room and phone numbers,

organization designations, work email address, or other identifying information regarding buildings, room numbers, or places of employment)

- Position descriptions, identification of job elements, and those performance standards (but not actual performance appraisals) that the release of which would not interfere with law enforcement programs or severely inhibit agency effectiveness
- Security clearances held
- Written biographies (e.g. to be used in a program describing a speaker)
- Academic credentials
- Schools attended
- Major or area of study
- Personal information stored by individuals about themselves on their assigned workstation or laptop unless it contains a Social Security Number

S. Annual Compliance Audits

If a for-profit entity is a Recipient or Subrecipient and has expended greater than \$500K of Federal funds in a respective fiscal year, an annual compliance audit performed by an independent auditor may be required. For additional information, please refer to 10 C.F.R. § 600.316 and for-profit audit guidance documents posted under the “Coverage of Independent Audits” heading at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>

If an educational institution, non-profit organization, or state/local government is a Recipient or Subrecipient and has expended greater than \$500K of Federal funds in a respective fiscal year, then an A-133 audit is required. For additional information, please refer to OMB Circular A-133 link below.
<http://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a133/a133.pdf>

Applicants and sub-recipients (if applicable) should propose sufficient costs in the project budget to cover the costs associated with the audit. DOE will share in the cost of the audit at its applicable cost share ratio.

Attachment 1 – Definitions

“Amendment” means a revision to a FOA

"Applicant" means the legal entity or individual signing the Application. This entity or individual may be one organization or a single entity representing a group of organizations (such as a Consortium) that has chosen to submit a single Application in response to a FOA.

"Application" means the documentation submitted in response to a FOA.

“Authorized Organization Representative (AOR)” is the person with assigned privileges who is authorized to submit grant applications through Grants.gov on behalf of an organization. *The privileges are assigned by the organization’s E-Business Point of Contact designated in the SAM.*

"Award" means the written documentation executed by a Contracting Officer, after an Applicant is selected, which contains the negotiated terms and conditions for providing Financial Assistance to the Applicant. A Financial Assistance Award may be either a Grant or a Cooperative Agreement.

"Budget" means the cost expenditure plan submitted in the Application, including both the DOE contribution and the Applicant Cost Share.

"Consortium (plural consortia)" means the group of organizations or individuals that have chosen to submit a single Application in response to a FOA.

"Contracting Officer" means the DOE official authorized to execute Awards on behalf of DOE and who is responsible for the business management and non-program aspects of the Financial Assistance process.

"Cooperative Agreement" means a Financial Assistance instrument used by DOE to transfer money or property when the principal purpose of the transaction is to accomplish a public purpose of support or stimulation authorized by Federal statute, and Substantial Involvement (see definition below) is anticipated between DOE and the Applicant during the performance of the contemplated activity. Refer to *10 CFR Part 600.5* for additional information regarding cooperative agreements and substantial involvement.

"Cost Sharing" means the respective share of Total Project Costs to be contributed by the Applicant and by DOE. The percentage of Applicant Cost Share is to be applied to the Total Project Cost (i.e., the sum of Applicant plus DOE Cost Shares) rather than to the DOE contribution alone.

“Data Universal Numbering System (DUNS) Number” is a unique nine-character identification number issued by Dun and Bradstreet (D&B). Organizations must have a DUNS number prior to registering in the SAM. Call 1-866-705-5711 to receive one free of charge.

“E-Business Point of Contact (POC)” is the individual who is designated as the Electronic Business Point of Contact in the SAM registration. This person is the sole authority of the organization with the capability of designating or revoking an individual’s ability to conduct SAM transactions.

“E-Find” is a Grants.gov webpage where you can search for Federal Funding Opportunities in FedGrants. <http://www.grants.gov/web/grants/search-grants.html>.

“EERE Exchange” is the Department of Energy, Energy Efficiency and Renewable Energy’s web system for posting Federal FOAs and receiving applications.

"Financial Assistance" means the transfer of money or property to an Applicant or Participant to accomplish a public purpose of support authorized by Federal statute through Grants or Cooperative Agreements and sub-awards. For DOE, it does not include direct loans, loan guarantees, price guarantees, purchase agreements,

Cooperative Research and Development Agreements (CRADAs), or any other type of financial incentive instrument.

“FedConnect” is where federal agencies make awards via the web. <https://www.fedconnect.net/FedConnect/>

“Federally Funded Research and Development Center (FFRDC)” means a research laboratory as defined by Federal Acquisition Regulation 35.017.

“Funding Opportunity Announcement (FOA)” is a publicly available document by which a Federal agency makes known its intentions to award discretionary grants or cooperative agreements, usually as a result of competition for funds. FOAs may be known as FOAs, notices of funding availability, solicitations, or other names depending on the agency and type of program.

“Geothermal” refers to the stored thermal energy in, or heat produced from, the Earth’s interior.

“Geothermal Resources” are defined as geothermal conditions where the technology exists to use the stored thermal energy to either produce electricity or for direct use, e.g., space heating, district heating, snow melting, aquaculture, etc.

“Grant” means a Financial Assistance instrument used by DOE to transfer money or property when the principal purpose of the transaction is to accomplish a public purpose of support or stimulation authorized by Federal statute, and no Substantial Involvement is anticipated between DOE and the Applicant during the performance of the contemplated activity.

“Grants.gov” is the “storefront” web portal which allows organizations to electronically find grant opportunities from all Federal grant-making agencies. Grants.gov is THE single access point for over 900 grant programs offered by the 26 Federal grant-making agencies. <http://www.grants.gov/web/grants/home.html>

“Hydrothermal Resources” are defined as those geothermal resources that contain sufficient heat, fluid and permeability to be commercially productive using existing drilling, reservoir engineering and power conversion technologies; are currently being produced.

“Indian Tribe” means any Indian tribe, band, nation, or other organized group or community, including Alaska Native village or regional or village corporation, as defined in or established pursuant to the Alaska Native Claims Settlement Act (85 Stat. 688)[43 U.S.C. § 1601 et seq.], which are recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

“Key Personnel” mean the individuals who will have significant roles in planning and implementing the proposed Project on the part of the Applicant and Participants, including FFRDCs.

“Marketing Partner Identification Number (MPIN)” is a very important password designated by your organization when registering in SAM. The E-Business Point of Contact will need the MPIN to assign privileges to the individual(s) authorized to perform SAM transactions on behalf of your organization. The MPIN must have 9 digits containing at least one alpha character (must be in capital letters) and one number (no spaces or special characters permitted).

“Participant” for purposes of this FOA only, means any entity, except the Applicant substantially involved in a Consortium, or other business arrangement (including all parties to the Application at any tier), responding to the FOA.

“Principal Investigator” refers to the technical point of contact/Project Manager for a specific project award.

“Project” means the set of activities described in an Application, State plan, or other document that is approved by DOE for Financial Assistance (whether such Financial Assistance represents all or only a portion of the

support necessary to carry out those activities).

“Proposal” is the term used to describe the documentation submitted in response to a FOA. Also see Application.

“Recipient” means the organization, individual, or other entity that receives a Financial Assistance Award from DOE, is financially accountable for the use of any DOE funds or property provided for the performance of the Project, and is legally responsible for carrying out the terms and condition of the award.

“System for Award Management (SAM)” is the primary database which collects, validates, stores and disseminates data in support of agency missions (<https://www.sam.gov>).

“Selection” means the determination by the DOE Selection Official that negotiations take place for certain Projects with the intent of awarding a Financial Assistance instrument.

“Selection Official” means the DOE official designated to select Applications for negotiation toward Award under a subject FOA.

“Substantial Involvement” means involvement on the part of the Government. DOE's involvement may include shared responsibility for the performance of the Project; providing technical assistance or guidance which the Applicant is to follow; and the right to intervene in the conduct or performance of the Project. Such involvement will be negotiated with each Applicant prior to signing any agreement.

“Technology Investment Agreement (TIA)” is a type of assistance instrument used to support or stimulate research projects involving for-profit firms, especially commercial firms that do business primarily in the commercial marketplace. TIAs are different from grants and cooperative agreements in that the award terms may vary from the Government-wide standard terms (See DOE TIA regulations at 10 CFR Part 603). The primary purposes for including a TIA in the type of available award instruments are to encourage non-traditional Government contractors to participate in an R&D program and to facilitate new relationships and business practices. A TIA can be particularly useful for awards to consortia (See 10 CFR 603.225(b) and 603.515, Qualification of a consortium).

“Total Project Cost” means all the funds to complete the effort proposed by the Applicant, including DOE funds (including direct funding of any FFRDC) plus all other funds that will be committed by the Applicant as Cost Sharing.

“Tribal Energy Resource Development Organization or Group” means an “organization” of two or more entities, at least one of which is an Indian Tribe (see “Indian Tribe” above) that has the written consent of the governing bodies of all Indian Tribes participating in the organization to apply for a grant or loan, or other assistance under 25 U.S.C. § 3503.

Attachment 2 – Cost Share Information

Cost Sharing or Cost Matching

The terms “cost sharing” and “cost matching” are often used synonymously. Even the DOE Financial Assistance Regulations, 10 CFR Part 600, use both of the terms in the titles specific to regulations applicable to cost sharing. DOE almost always uses the term “cost sharing,” as it conveys the concept that **non-federal share is calculated as a percentage of the Total Project Cost**. An exception is the State Energy Program Regulation, 10 CFR 420.12, State Matching Contribution. Here “cost matching” for the non-federal share is calculated as a percentage of the Federal funds only, rather than the Total Project Cost.

How Cost Sharing Is Calculated

As stated above, cost sharing is calculated as a percentage of the Total Project Cost. Following is an example of how to calculate cost sharing amounts for a project with \$1,000,000 in federal funds with a minimum 20% non-federal cost sharing requirement:

Formula: Federal share (\$) divided by Federal share (%) = Total Project Cost

Example: \$1,000,000 divided by 80% = \$1,250,000

Formula: Total Project Cost (\$) minus Federal share (\$) = Non-federal share (\$)

Example: \$1,250,000 minus \$1,000,000 = \$250,000

Formula: Non-federal share (\$) divided by Total Project Cost (\$) = Non-federal share (%)

Example: \$250,000 divided by \$1,250,000 = 20%

See the sample cost share calculation for a blended cost share percentage below. **Keep in mind that FFRDC funding is DOE funding.**

What Qualifies For Cost Sharing

While it is not possible to explain what specifically qualifies for cost sharing in one or even a couple of sentences, in general, if a cost is allowable under the cost principles applicable to the organization incurring the cost and is eligible for reimbursement under a DOE grant or cooperative agreement, then it is allowable as cost share. Conversely, if the cost is not allowable under the cost principles and not eligible for reimbursement, then it is not allowable as cost share. In addition, costs may not be counted as cost share if they are paid by the Federal Government under another award unless authorized by Federal statute.

The rules associated with what is allowable as cost share are specific to the type of organization that is receiving funds under the grant or cooperative agreement, though are generally the same for all types of entities. The specific rules applicable to:

- Institutions of Higher Education, Hospitals, and Other Nonprofit Organizations are found at 10 CFR 600.123;
- State and Local Governments are found at 10 CFR 600.224;
- For-profit Organizations are found at 10 CFR 600.313.

In addition to the regulations referenced above, other factors may also come into play such as timing of donations and length of the project period. For example, the value of ten years of donated maintenance on a project that has a project period of five years would not be fully allowable as cost share. Only the value for the five years of donated maintenance that corresponds to the project period is allowable and may be counted as cost share.

Additionally, DOE generally does not allow pre-award costs for either cost share or reimbursement when these

costs precede the signing of the appropriation bill that funds the award. In the case of a competitive award, DOE generally does not allow pre-award costs prior to the signing of the Selection Statement by the DOE Selection Official.

Following is a link to the DOE Financial Assistance Regulations. You can click on the specific section for each Code of Federal Regulations reference mentioned above.

[DOE Financial Assistance Rules \(10 CFR Part 600\)](#)

As stated above, the rules associated with what is allowable cost share are generally the same for all types of organizations. Following are the rules found to be common, but again, the specifics are contained in the regulations and cost principles specific to the type of entity:

(A) *Acceptable contributions*. All contributions, including cash contributions and third party in-kind contributions, must be accepted as part of the recipient's cost sharing if such contributions meet all of the following criteria:

- (1) They are verifiable from the recipient's records.
- (2) They are not included as contributions for any other federally-assisted project or program.
- (3) They are necessary and reasonable for proper and efficient accomplishment of project or program objectives.
- (4) They are allowable under the cost principles applicable to the type of entity incurring the cost as follows:

(a) *For-profit organizations*. Allowability of costs incurred by for-profit organizations and those nonprofit organizations listed in Attachment C to OMB Circular A-122 is determined in accordance with the for-profit costs principles in 48 CFR Part 31 in the Federal Acquisition Regulation, except that patent prosecution costs are not allowable unless specifically authorized in the award document. (v) Commercial Organizations. [FAR Subpart 31.2—Contracts with Commercial Organizations](#)

(b) *Other types of organizations*. Allowability of costs incurred by other types of organizations that may be subrecipients under a prime award is determined as follows:

(i) *Institutions of higher education*. Allowability is determined in accordance with: [2 CFR Part 220 Cost Principles for Educational Institutions](#)

(ii) *Other nonprofit organizations*. Allowability is determined in accordance with: [2 CFR Part 230 Cost Principles for Nonprofit Organizations](#)

(iii) *Hospitals*. Allowability is determined in accordance with the provisions of: [Title 45 Appendix E to Part 74—Principles for Determining Costs Applicable to Research and Development Under Grants and Contracts With Hospitals](#)

(iv) *Governmental organizations*. Allowability for State, local, or federally recognized Indian tribal government is determined in accordance with: [2 CFR PART 225—Cost Principles for State, Local, and Indian Tribal Governments \(OMB Circular A-87\)](#)

- (5) They are not paid by the Federal Government under another award unless authorized by Federal statute to be used for cost sharing or matching.

(6) They are provided for in the approved budget.

(B) *Valuing and documenting contributions*

(1) *Valuing recipient's property or services of recipient's employees.* Values are established in accordance with the applicable cost principles, which mean that amounts chargeable to the project are determined on the basis of costs incurred. For real property or equipment used on the project, the cost principles authorize depreciation or use charges. The full value of the item may be applied when the item will be consumed in the performance of the award or fully depreciated by the end of the award. In cases where the full value of a donated capital asset is to be applied as cost sharing or matching, that full value must be the lesser or the following:

- (a) The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or
- (b) The current fair market value. If there is sufficient justification, the Contracting Officer may approve the use of the current fair market value of the donated property, even if it exceeds the certified value at the time of donation to the project. The Contracting Officer may accept the use of any reasonable basis for determining the fair market value of the property.

(2) *Valuing services of others' employees.* If an employer other than the recipient furnishes the services of an employee, those services are valued at the employee's regular rate of pay, provided these services are for the same skill level for which the employee is normally paid.

(3) *Valuing volunteer services.* Volunteer services furnished by professional and technical personnel, consultants, and other skilled and unskilled labor may be counted as cost sharing or matching if the service is an integral and necessary part of an approved project or program. Rates for volunteer services must be consistent with those paid for similar work in the recipient's organization. In those markets in which the required skills are not found in the recipient organization, rates must be consistent with those paid for similar work in the labor market in which the recipient competes for the kind of services involved. In either case, paid fringe benefits that are reasonable, allowable, and allocable may be included in the valuation.

(4) *Valuing property donated by third parties.*

- (a) Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the cost sharing or matching share must be reasonable and must not exceed the fair market value of the property at the time of the donation.
- (b) Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the award or fully depreciated by the end of the award, provided that the Contracting Officer has approved the charges. When use charges are applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:
 - (i) The value of donated space must not exceed the fair rental value of comparable space as established by an independent appraisal of comparable space and facilities in a privately-owned building in the same locality.
 - (ii) The value of loaned equipment must not exceed its fair rental value.

(5) *Documentation.* The following requirements pertain to the recipient's supporting records for in-kind

contributions from third parties:

- (a) Volunteer services must be documented and, to the extent feasible, supported by the same methods used by the recipient for its own employees.
- (b) The basis for determining the valuation for personal services and property must be documented.

**SAMPLE COST SHARE CALCULATION
FOR BLENDED COST SHARE PERCENTAGE**

The following example shows the math for calculating required cost share for a project with \$2,000,000 in Federal funds with four tasks requiring different Non-federal cost share percentages:

<u>Task</u>	<u>Proposed Federal Share</u>	<u>Required Federal Share %</u>	<u>Non-federal Cost Share %</u>
Task 1 (R&D)	\$1,000,000	80%	20%
Task 2 (R&D)	500,000	80%	20%
Task 3 (Demonstration)	400,000	50%	50%
Task 4 (Outreach)	<u>100,000</u>	100%	0%
	\$2,000,000		

Federal share (\$) divided by Federal share (%) = Task Cost

Each task must be calculated individually as follows:

Task 1

\$1,000,000 divided by 80% = \$1,250,000 (Task 1 Cost)

Task 1 Cost minus federal share = Non-federal share

\$1,250,000 - \$1,000,000 = **\$250,000 (Non-federal share)**

Task 2

\$500,000 divided 80% = \$625,000 (Task 2 Cost)

Task 2 Cost minus federal share = Non-federal share

\$625,000 - \$500,000 = **\$125,000 (Non-federal share)**

Task 3

\$400,000 / 50% = \$800,000 (Task 3 Cost)

Task 3 Cost minus federal share = Non-federal share

\$800,000 - \$400,000 = **\$400,000 (Non-federal share)**

Task 4

Federal share = \$100,000

Non-federal cost share is not mandated for outreach = **\$0 (Non-federal share)**

The calculation may then be completed as follows:

<u>Task</u>	<u>Proposed Federal Share</u>	<u>Federal Share %</u>	<u>Required</u>		<u>Total</u>
			<u>Non-federal Cost Share \$</u>	<u>Non-federal Cost Share %</u>	
Task 1	\$1,000,000	80%	\$250,000	20%	\$1,250,000
Task 2	500,000	80%	125,000	20%	625,000
Task 3	400,000	50%	400,000	50%	800,000
Task 4	<u>100,000</u>	100%	<u>0</u>	0%	<u>100,000</u>
	\$2,000,000		\$775,000		\$2,775,000

Blended Cost Share %

Non-federal share (\$775,000) divided by Total Project Cost (\$2,775,000) = 27.9% (Non-federal)

Federal share (\$2,000,000) divided by Total Project Cost (\$2,775,000) = 72.1% (Federal)

Attachment 3 – Example Site Characterization Data Inventory

Resource Characteristics (Select One)

- Basement EGS (“Greenfield” EGS)
- EGS on the margins of existing operational hydrothermal fields
 - If so, please include the distance to operational field and the flow history of existing wells at the proposed site
- Other

For each italicized data element below, please provide the following:

- Year(s) of data collection
- Tool/Methodology
- Application Page Number where values are detailed

Thermal Characteristics

- *Bottomhole temperature (BHT) measurements:*
- *Heat flow measurements:*
- *Heat flow map:*
- *Temperature profile for site (temperature isotherms, 2D or 3D map):*
- *Heat generation mechanism:*
- *Thermal conductivity as a function of depth:*
- *Geothermal gradient:*
- *Radioactivity of the crustal rocks:*
- *Thickness of the radioactive layer:*

Reservoir and Subsurface Characterization

- *Depth to resource:*
- *Reservoir planar area:*
- *Stratigraphy/stratigraphic columns:*
- *Lithology:*
- *Stress state:*
- *Permeability data:*
- *Pore space (in a sedimentary rock):*
- *Existing features:*
 - *Fracture location:*
 - *Fracture orientation:*
 - *Fracture aperture:*
- *Existing faults (location, proximity, activity):*
- *Lithology logs:*
- *Subsurface data:*
 - *Gravity data:*
 - *MT Surveys:*
 - *Seismic reflection:*
 - *Resistivity:*

- *Geochemistry:*
 - *Geothermometry:*
 - *Fluid chemistry (pH, salinity, TDS, etc.):*
 - *Scaling potential:*
 - *Corrosion potential:*
 - *Ability to do chemical stimulations:*
 - *Reservoir short-circuiting due to potential precipitation (or dissolution):*
- *Mechanical behavior of reservoir:*
- *Geologic mapping:*
- *Conceptual model:*

Surface Data

- *Thermal characteristics:*
 - *Average ground surface temperature:*
 - *Surface heat flow:*
 - *Regional heat flow (i.e., the heat flow from below the radioactive layer):*
- *Gravity data:*
- *Chemistry:*
- *Aerial photography:*
- *Remote Sensing:*

Geologic

- *Regional stress direction and magnitude:*
- *X years of seismic data from seismic array in place:*
- *Seismic array in place:*
- *Paleo-seismic data:*
- *Distance to existing faults, type of fault and size:*
- *Level of seismic activity:*
- *Stress state/tectonic stress:*
 - *Stress sub-parameters in areas of extension (e.g., fault orientation, presence or absence of a fault, Coulomb stress change):*
 - *Occurrence of a structural zone including compression and/or dilatation:*

Existing Wells

- *Depth of existing wells:*
- *Type (full sized, core hole, shallow gradient holes):*
- *Status (active, P&A):*
- *Well integrity logs and/or testing (please list):*
- *Ease of drilling (select those that apply):*
 - *Easy drilling (High ROP)*
 - *Moderate drilling (medium ROP, some history of drilling trouble)*
 - *Difficult drilling (low ROP, history of trouble)*

Attachment 4 – Example Permitting Inventory

For each selected data element below, please include any relevant permitting information and a supporting narrative (up to 2 paragraphs).

Surface Ownership

- *Ownership (select those that apply and describe if necessary):*
 - BLM
 - BIA
 - DOD
 - National Park Service
 - USFS
 - USFW
 - private
- *Total acreage of proposed site:*
- *Total acreage components (select those that apply):*
 - Contiguous sections
 - Parcels that can be combined (please describe)

Environmental and Cultural Conditions – Please describe all bullets below using any available information (existing databases or previous environmental studies) and include a distance from the proposed site to the resource in question for each:

- *Existing environmental activities (select those that apply):*
 - Environmental Impact Statement complete
 - Environmental Assessment complete
 - Environmental Studies performed in area
 - No history of environmental studies
- *Nearby population center density:*
 - Distance:
- *Nearby wildlife habitats (endangered species / habitat)*
- *Nearby scenic vistas:*
- *Nearby Areas of Critical Environmental Concern or Wilderness Areas:*
- *Nearby wetlands or scenic waterways:*
- *Nearby Native American Tribes:*
- *Potential for landslides, or excessive subsidence as a result of induced seismic activity:*
 - Existence of historic structures or identified cultural resources in the immediate vicinity of the proposed project area
- A review of any potential issues associated with the National Historic Preservation Act.
- An indication of whether public opposition is likely (i.e., letters of support from local municipalities or County, negative or positive press surrounding existing development at the proposed site).

Permitting Status

- *Existing exploration permits:*
- *Approved well permits (select those that apply and describe):*
 - Well drilled, commercial
 - Drilled and not commercial
 - Drilled: P&A'd, active lease
 - Not drilled

- *Permits Pending approval (select those that apply and describe if relevant to proposed actions associated with FORGE):*
 - *Scope of project*
- *Proposed Completion date. Describe status or provide link to document or FONSI for any that apply:*
 - EA
 - EIS
 - EIS (including reservoir stimulation)
- *Describe any issues encountered in the past during the permitting process, including technical, logistical, social, and cultural.*

Mineral Rights

- *Mineral rights ownership (select those that apply):*
 - Federal
 - State
 - Private

Lease Status (select those that apply)

- No lease
- *Pending development lease (Please describe)*
- Active lease
 - *Type:*
 - *Unit area:*
 - *Utilization sites:*
 - *Participating areas:*
 - *Expiration date:*
- *Expired lease (Please describe)*

Water availability

- *Water availability on site:*
- *Water availability at ____ distance:*
 - *Nearby high flow streams or rivers:*
 - *Temporary surface reservoir during the rainy season:*
 - *Local streams that may be dammed and diverted:*
 - *Status of existing infrastructure to transport water:*
 - *Potential barriers to development of transport infrastructure:*
- *Water rights (select those that apply and describe):*
 - *Included/secured with land/lease deal*
 - *Can be purchased easily*
 - *Can be purchased with difficulty*
 - *Water rights not available*
 - *Senior/Junior*
- *Other local water demands for agricultural or other purpose:*

State and Local Regulations

- *Solid waste disposal standards:*
 - *Access and limitations on waste disposal:*
- *Noise standards:*
- *Air quality standards:*
- *Drinking water and aquatic life protection:*
- *Compatible land use:*

- *Acceptable local effects of heat rejection:*

Transmission Accessibility

- *Proximity to transmission and distribution infrastructure:*

Year-Round Accessibility

- *Year round access (weather):*
- *Proximity to all season road:*

Attachment 5 – Statement of Project Objectives Format

Title

[Include a concise, descriptive title for the work to be performed]

A. Objectives

[Include one to three paragraphs stating the overall objectives of the work, including objectives of each phase of the work.]

B. Scope of Project

[Include one-half to one full page summarizing the effort and the approach that will be taken to achieve the objectives of the project.]

C. Tasks to Be Performed [Include all tasks to be performed necessary to achieve the project's objectives. For Phase 1, the Applicant shall provide a detailed description of all task and sub-task activities. The Applicant shall provide a high-level discussion of the tasks to be completed in Phase 2 and 3. Tasks and subtasks should be divided among major categories of work in the project (e.g. Planning, Site Preparation and Characterization, Technology Testing and Evaluation). This section must include a Project Management Task, similar to the format given below.]

PHASE 1 - PLANNING

Task 1.0 – Project Management and Planning

Note to Applicant; include the following Task 1 content directly in your application:

The Recipient shall submit a revised PMP. The revised PMP shall define the approach to management of the project and include information relative to project risk, timelines, milestones, funding and cost plans, and decision-point success criteria.

The Recipient shall execute the project in accordance with the approved Project Management Plan covering the entire project period. The Recipient shall manage and control project activities in accordance with their established processes and procedures to ensure subtasks and tasks are completed within schedule and budget constraints defined by the Project Management Plan. This includes tracking and reporting progress and project risks to DOE and other stakeholders.

Task 2.0 – (Title)

(Description)

Subtask 2.1 – (Title)

(Description)

Subtask 2.2 – (Title)

(Description)

Task 3.0 – (Title)

(Description)

Subtask (Title/Description, as necessary)

Add additional tasks/subtasks as deemed necessary

DOWN SELECT End of Phase 1:

A down select decision will be made prior to Phase 2A FORGE activities. This decision will be based upon the Phase 1 presentation and the comprehensiveness of the Recipient's planning, as evidenced by completion of all Phase 1 deliverables as listed in this SOPO, for critical technical and logistical tasks that demonstrate the proposed site's viability and the Recipient's full commitment and capability to implement Phase 2 and 3 activities of FORGE as envisioned by DOE. Recipients desiring to continue their project into Phase 2 will be required to submit an updated cost proposal consistent with their defined scope detailing costs associated with all site operation and decommissioning/disposition activities. Note: Revised cost estimates will be required of all Phase 2 Recipients at all Go/No-Go decision and down select points. The Recipient shall not continue into Phase 2A activities without written authorization from the DOE Contracting Officer. Should Phase 2A not be initiated, the Phase 1 Topical Report shall serve as the final technical report for DOE purposes.

The Recipient shall submit a "Renewal Application" directly to the DOE Project Officer and the DOE Contract Specialist no later than 60 days prior to the end of Phase 1 – Planning.

PHASE 2A – ENVIRONMENTAL INFORMATION VOLUME (EIV) AND PRELIMINARY SEISMIC MONITORING

Provide a narrative discussion of the proposed technical approach to Phase 2A activities based on the Phase 2A objectives outlined in Section I and the Applicant's vision for accomplishing FORGE goals.

SAMPLE Go/No-Go DECISION POINT* End of Phase 2A:

A Go/No-Go decision will be made prior to Phase 2B FORGE activities based upon the successful completion of the EIV and other Phase 2A activities including the installation of an initial telemetered seismic array capable of recording events with magnitudes as small as magnitude 1.0, and preferably magnitude 0.0, and submittal of an updated cost proposal detailing costs associated with all site operation and decommissioning/disposition activities.

Selection criterion related to the EIV may include: Adequacy of environmental information describing the project and project site(s); potential environmental impacts of the proposed work; potential liability to DOE; proposer's ability to meet compliance requirements; proposer's experience and approach to identification and resolution of environmental issues.

**Placement of decision points will be finalized during the negotiation stage.*

PHASE 2B – NEPA COMPLIANCE AND INITIAL CHARACTERIZATION

Provide a narrative discussion of the proposed technical approach to Phase 2B activities based on the Phase 2B objectives outlined in Section I and the Applicant's vision for accomplishing FORGE goals.

DOWN SELECT End of Phase 2B:

A down select decision will be made prior to Phase 3 FORGE activities. This down select will be based on the Phase 2 Topical Report, NEPA status, any additional site characterization data collected, and submittal of an updated cost proposal detailing costs associated with all site operation and decommissioning/disposition activities. The Recipient shall not continue into Phase 2C activities without written authorization from the DOE Contracting Officer. Should Phase 2C not be initiated, the Phase 2 Topical Report shall serve as the final technical report for DOE purposes.

PHASE 2C – SUBSURFACE CHARACTERIZATION AND SITE READINESS

Provide a narrative discussion of the proposed technical approach to Phase 2C activities based on the Phase 2C objectives outlined in Section I and the Applicant's vision for accomplishing FORGE goals.

A Go/No-Go decision will be made prior to Phase 3 FORGE activities.

PHASE 3 – TECHNOLOGY TESTING AND EVALUATION

Provide a narrative discussion of the proposed technical approach to Phase 3 activities based on the Phase 3 objectives outlined in Section I and the Applicant's vision for accomplishing FORGE goals.

D. Deliverables

The Recipient shall provide reports in accordance with the enclosed Federal Assistance Reporting Checklist and the instructions accompanying the Checklist.

In addition to the reporting requirements described in the Federal Reporting Assistance Checklist, the following Task-Specific Report/Plans are required during the implementation of the project. A brief description is provided so that the Applicants understand the nature of these future deliverables and account for them in their application.

Phase 1:

- 1) Revised/Updated PMP
- 2) Conceptual Geologic Model
- 3) Data Dissemination and Intellectual Property Plan
- 4) Core Curation Plan
- 5) Preliminary Induced Seismicity Mitigation Plan
- 6) Environmental, Safety and Health Plan
- 7) Communications and Outreach Plan
- 8) Research and Development Implementation Plan
- 9) Environmental Information Synopsis (including update of Permitting Inventory)

- 10) Phase 1 Topical Report (including update on Characterization Data uploaded to GDR [including update of Site Characterization Data Inventory] and update on Stakeholder Engagement Status)
- 11) Phase 1 Presentation

Phase 2A – anticipated deliverables:

- 1) Revised/Updated PMP
- 2) Environmental Information Volume including proposed schedule and budget to complete the NEPA process
- 3) Preliminary, telemetered surface seismic array
- 4) Phase 2A Presentation

Phase 2B – anticipated deliverables:

- 1) Required permitting documents (e.g., Environmental Assessment or Environmental Impact Statement)
- 2) Record of submittal of curated Phase 2 data to the GDR
- 3) Final Induced Seismicity Mitigation Plan
- 4) Phase 2B Topical Report

Phase 2C – anticipated deliverables:

- 1) Revised/Updated PMP
- 2) Updated Geologic Model
- 3) Operable NDGS-compatible Data System/Node
- 4) STAT Charter and Governance Document
- 5) Baseline metric report
- 6) Draft 1st round R&D solicitation
- 7) Phase 2 Topical Report (summarizing activities in all of Phase 2)
- 8) Annual Operating Plan (AOP) for Phase 3, year 1 technology testing and evaluation

Phase 3 – anticipated deliverables:

- 1) Revised/Updated PMP
- 2) Phase 3 Topical Reports (annual)
- 3) Phase 3 Annual Operating Plan(s)
- 4) Final Project Report
- 5) Site Disposition Close-out Report

E. Meetings and Project Briefings

The Recipient shall prepare detailed briefings for presentation to the DOE Project Officer at the Project Officer's facility located in Pittsburgh, PA or Morgantown, WV, or at an alternate site as designated by the Project Officer. Briefings shall be given by the Recipient to explain the plans, progress, and results of

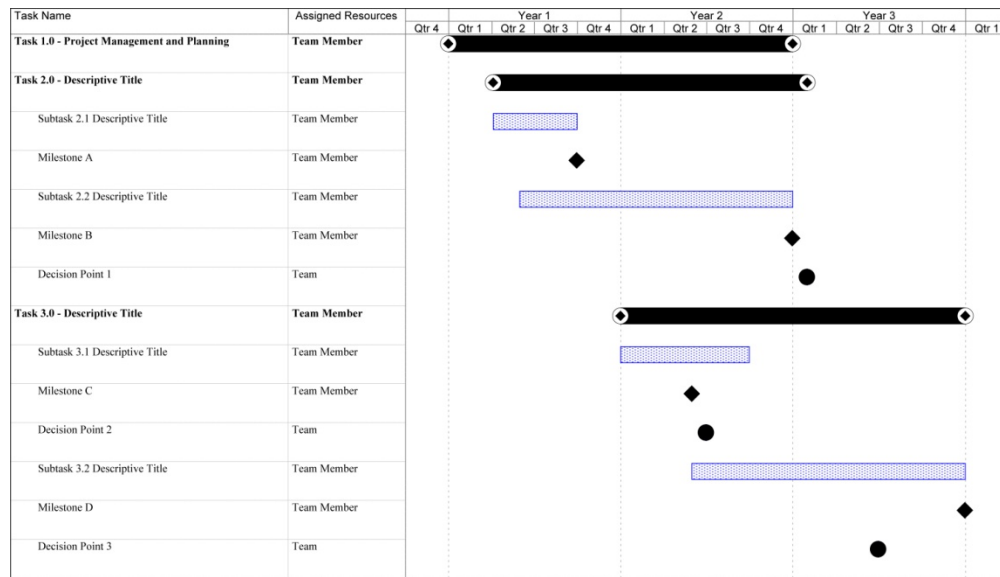
the technical effort at the completion of each budget period and subphase and on an annual basis at a minimum. Briefings shall also include a Kickoff Meeting soon after award.

[The Recipient shall provide a specific list of Meetings and Project Briefings to be held during Phase 1.]

Attachment 6 – Project Management Plan Format

A. Project Timeline: Provide a timeline of the project (similar to a Gantt chart) broken down by each task and subtask, as described in the Statement of Project Objectives. The timeline should include for each task, a start date, and end date. The timeline should show interdependencies between tasks and include the milestones that are identified in the Milestone Log (see Section B below).

Example Project Schedule



B. Milestone Log: Provide milestones for each phase of the project. Each milestone should include a title and planned completion date. Milestones should be quantitative and show progress toward budget period and/or project goals.

Format for the milestone log should be as follows:

Title: {Milestone Title}
 Planned Date: {Planned Completion Date}
 Verification Method: {Milestone Verification Method}

[Note: During project performance, the Recipient will report the Milestone Status as part of the required quarterly Progress Reporting]

C. Success Criteria at Decision Points: Provide success criteria for each decision point in the project, including Go/No-Go Decision Points and the conclusions of phases and subphases and the entire project. The success criteria should be objective and stated in terms of specific, measurable, and repeatable data. Usually, the success criteria pertain to desirable outcomes, results, and observations from the project.

D. Payment and Funding Profile: Provide a table that shows, by month, the government payments or disbursements planned for Phase 1. The table should also include the amount of projected government funding going to each project team member, by month. The “Project Payment and Funding Profile” should account for billing delays associated with the recipient billing process prior to requested reimbursement by the DOE.

Example: Project Payment and Funding Profile Table

	Monthly Phase 1 Payments	Amount to Applicant	Amount to Partner A	Amount to Partner B
October				
November				
December				
January				
February				
March				
April				
May				
June				
July				
August				
September				
Total (\$)				

Attachment 7 – Model Cooperative Agreement

SPECIAL TERMS AND CONDITIONS FOR USE IN MOST GRANTS AND COOPERATIVE AGREEMENTS

RESOLUTION OF CONFLICTING CONDITIONS

Any apparent inconsistency between Federal statutes and regulations and the terms and conditions contained in this award must be referred to the DOE Award Administrator for guidance.

AWARD AGREEMENT TERMS AND CONDITIONS

This award/agreement consists of the Grant and Cooperative Agreement cover page, plus the following:

- a. Special terms and conditions.
- b. Attachments:

Attachment No.	Title
1	Intellectual Property Provisions
2	Statement of Project Objectives
3	Federal Assistance Reporting Checklist
4	Budget Pages
- c. Applicable program regulations [Name of Regulations][Date].
- d. DOE Assistance Regulations, 10 CFR 600 at <http://ecfr.gpoaccess.gov>.
- e. If the award is for research and to a university or non-profit, the Research Terms & Conditions and the DOE Agency Specific Requirements at <http://www.nsf.gov/awards/managing/rtr.jsp>.
- f. Application/proposal as approved by DOE.
- g. National Policy Assurances to Be Incorporated as Award Terms in effect on date of award at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

PAYMENT PROCEDURES - REIMBURSEMENT THROUGH THE AUTOMATED CLEARING HOUSE (ACH) VENDOR INQUIRY PAYMENT ELECTRONIC REPORTING SYSTEM (VIPERS)

- a. Method of Payment. Payment will be made by reimbursement through ACH.
- b. Requesting Reimbursement. Requests for reimbursements must be made electronically through Department of Energy's Oak Ridge Financial Service Center (ORFSC) VIPERS. To access and use VIPERS, you must enroll at <https://vipers.oro.doe.gov/>. Detailed instructions on how to enroll are provided on the web site.

For non-construction awards, you must submit a Standard Form (SF) 270, "Request for Advance or Reimbursement" at <https://vipers.oro.doe.gov/> and attach a file containing appropriate supporting documentation. The file attachment must show the total federal share claimed on the SF 270, the non-federal share claimed for the billing period if cost sharing is required, and cumulative expenditures to date (both Federal and non-Federal) for each of the following categories: salaries/wages and fringe benefits; equipment; travel; participant/training support costs, if any; other direct costs, including subawards/contracts; and indirect costs. For construction awards, you must submit a SF 271, "Outlay Report and Request for Reimbursement for Construction Programs," through VIPERS.

- c. Timing of submittals. Submittal of the SF 270 or SF 271 should coincide with your normal billing pattern, but not more frequently than every two weeks. Requests for reimbursement must be limited to the amount of disbursements made during the billing period for the federal share of direct project costs and the proportionate share of any allowable indirect costs incurred during that billing period.
- d. Adjusting payment requests for available cash. You must disburse any funds that are available from repayments to and interest earned on a revolving fund, program income, rebates, refunds, contract settlements, audit recoveries, credits, discounts, and interest earned on any of those funds before requesting additional cash payments

from DOE/NNSA.

e. Payments. The DOE approving official will approve the invoice as soon as practicable but not later than 30 days after your request is received, unless the billing is improper. Upon receipt of an invoice payment authorization from the DOE approving official, the ORFSC will disburse payment to you. You may check the status of your payments at the VIPER web site. All payments are made by electronic funds transfer to the bank account identified on the ACH Vendor/Miscellaneous Payment Enrollment Form (SF 3881) that you filed.

REBUDGETING AND RECOVERY OF INDIRECT COSTS - REIMBURSABLE INDIRECT COSTS AND FRINGE BENEFITS *[if applicable]*

a. If actual allowable indirect costs are less than those budgeted and funded under the award, you may use the difference to pay additional allowable direct costs during the project period. If at the completion of the award the Government's share of total allowable costs (i.e., direct and indirect), is less than the total costs reimbursed, you must refund the difference.

b. Recipients are expected to manage their indirect costs. DOE will not amend an award solely to provide additional funds for changes in indirect cost rates. DOE recognizes that the inability to obtain full reimbursement for indirect costs means the recipient must absorb the underrecovery. Such underrecovery may be allocated as part of the organization's required cost sharing.

REBUDGETING AND RECOVERY OF INDIRECT COSTS - REIMBURSABLE INDIRECT COSTS *[if applicable]*

a. If actual allowable indirect costs are less than those budgeted and funded under the award, you may use the difference to pay additional allowable direct costs during the project period. If at the completion of the award the Government's share of total allowable costs (i.e., direct and indirect), is less than the total costs reimbursed, you must refund the difference.

b. Recipients are expected to manage their indirect costs. DOE will not amend an award solely to provide additional funds for changes in indirect cost rates. DOE recognizes that the inability to obtain full reimbursement for indirect costs means the recipient must absorb the underrecovery. Such underrecovery may be allocated as part of the organization's required cost sharing.

c. The budget for this award includes indirect costs, but does not include fringe benefits. Therefore, fringe benefit costs shall not be charged to nor shall reimbursement be requested for this project nor shall the fringe benefit costs for this project be allocated to any other federally sponsored project. In addition, fringe benefit costs shall not be counted as cost share unless approved by the Contracting Officer.

REBUDGETING AND RECOVERY OF INDIRECT COSTS - INDIRECT COSTS AND FRINGE BENEFITS ARE NOT REIMBURSABLE *[if applicable]*

The budget for this award does not include indirect costs or fringe benefits. Therefore, these expenses shall not be charged to nor reimbursement requested for this project nor shall the fringe and indirect costs from this project be allocated to any other federally sponsored project. In addition, indirect costs or fringe benefits shall not be counted as cost share unless approved by the Contracting Officer.

PRE-AWARD COSTS *[if applicable]*

You are entitled to reimbursement for costs incurred on or after [MonthDayYear], as authorized by the pre-award costs letter dated [Date of Approval Letter], if such costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600.

USE OF PROGRAM INCOME - ADDITION *[if applicable]*

If you earn program income during the project period as a result of this award, you may add the program income to the funds committed to the award and use it to further eligible project objectives.

STATEMENT OF FEDERAL STEWARDSHIP

DOE/NNSA will exercise normal Federal stewardship in overseeing the project activities performed under this award. Stewardship activities include, but are not limited to, conducting site visits; reviewing performance and financial reports; providing technical assistance and/or temporary intervention in unusual circumstances to correct deficiencies which develop during the project; assuring compliance with terms and conditions; and reviewing technical performance after project completion to ensure that the award objectives have been accomplished.

STATEMENT OF SUBSTANTIAL INVOLVEMENT

DOE will be substantially involved with the Recipient during the performance of the resultant cooperative agreement. DOE shall have a substantial role in project decision making, including participation in decisions related to the technical, programmatic, and/or financial aspects of the project and/or operation of the FORGE.

Recipient's responsibilities will include:

- Performing the activities described in FORGE Statement of Project Objectives (SOPO), the Project Management Plan (PMP), and the Annual Operating Plan (AOP) including providing the required personnel, facilities, equipment, supplies and services;
- Managing and controlling project activities in accordance with established processes and procedures to ensure tasks and subtasks are completed within schedule and budget constraints defined by the current PMP and AOP;
- Notifying DOE in a timely manner of issues that arise during the course of the project that jeopardize the technical, schedule and/or budget objectives;
- Coordinating project activities with external organizations, including subrecipients, consultants, and DOE M&O contractors (as applicable), to ensure effective integration of all work elements;
- Defining approaches and plans, submitting the plans to the DOE Project Officer for review, and incorporating DOE comments;
- Ensuring that field monitoring and activities comply with the Induced Seismicity Protocol;
- Publication of all non-proprietary data for the geothermal community in a timely manner;
- Attending annual program review meetings and reporting project status, submitting required reports, and presenting project results at appropriate technical conferences; and
- Facilitating DOE evaluation of project work on the premises of the Recipient or a subrecipient.

DOE responsibilities will include:

- Collaborating with the Recipient regarding FORGE activities and recommending alternate approaches or delaying/shifting work emphasis, if needed, to adequately address critical project and/or programmatic issues;
- Review and concur with ongoing technical performance to ensure that technical progress has been achieved within sub-phases before work can proceed to subsequent phases;
- Appointment of members to review teams (in an amount of at least 30% representation) associated with the project (e.g., Site Management Team, Science and Technology Analysis Team) and participation in the formation of the consensus which will determine the direction and scope of the key development activities. In the event a consensus cannot be reached, the matter will be referred to the Office Director of GTO;

- Collaboration with the Recipient in the allocation of funds budgeted as work progresses and as funding needs may change between the different projects undertaken;
- Participation with the Recipient in the reviews of contractor activities and reports;
- Review and resolution of actual and perceived Conflict of Interest issues; and
- Serving as scientific/technical liaison between Recipient and other program or industry staff.

Refer to 10 CFR 600.5(b) for additional information describing substantial involvement: *“DOE has the right to intervene in the conduct or performance of project activities for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.”*

SITE VISITS

DOE/NNSA's authorized representatives have the right to make site visits at reasonable times to review project accomplishments and management control systems and to provide technical assistance, if required. You must provide, and must require your subrecipients to provide, reasonable access to facilities, office space, resources, and assistance for the safety and convenience of the government representatives in the performance of their duties. All site visits and evaluations must be performed in a manner that does not unduly interfere with or delay the work.

REPORTING REQUIREMENTS

- Requirements.** The reporting requirements for this award are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to this award. Failure to comply with these reporting requirements is considered a material noncompliance with the terms of the award. Noncompliance may result in withholding of future payments, suspension, or termination of the current award, and withholding of future awards. A willful failure to perform, a history of failure to perform, or unsatisfactory performance of this and/or other financial assistance awards, may also result in a debarment action to preclude future awards by Federal agencies.
- Dissemination of scientific/technical reports.** Scientific/technical reports submitted under this award will be disseminated on the Internet via the DOE Information Bridge (www.osti.gov/bridge), unless the report contains patentable material, protected data, or SBIR/STTR data. Citations for journal articles produced under the award will appear on the DOE Energy Citations Database (www.osti.gov/energycitations).
- Restrictions.** Reports submitted to the DOE Information Bridge must not contain any Protected Personal Identifiable Information (PII), limited rights data (proprietary data), classified information, information subject to export control classification, or other information not subject to release.

PUBLICATIONS

- You are encouraged to publish or otherwise make publicly available the results of the work conducted under the award.
- An acknowledgment of Federal support and a disclaimer must appear in the publication of any material, whether copyrighted or not, based on or developed under this project, as follows:

Acknowledgment: "This material is based upon work supported by the Department of Energy [National Nuclear Security Administration] [Add Other Agencies] under Award Number(s) [Enter the award number(s)]."

Disclaimer: "This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof."

FEDERAL, STATE, AND MUNICIPAL REQUIREMENTS

You must obtain any required permits and comply with applicable federal, state, and municipal laws, codes, and regulations for work performed under this award.

INTELLECTUAL PROPERTY PROVISIONS AND CONTACT INFORMATION

- a. The intellectual property provisions applicable to this award are provided as an attachment to this award or are referenced on the Assistance Agreement Face Page. A list of all intellectual property provisions may be found at <http://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>.
- b. Questions regarding intellectual property matters should be referred to the DOE Award Administrator and the Patent Counsel designated as the service provider for the DOE office that issued the award. The IP Service Providers List is found at <http://energy.gov/gc/downloads/intellectual-property-ip-service-providers-acquisition-and-assistance-transactions>.

NATIONAL SECURITY: CLASSIFIABLE RESULTS ORIGINATING UNDER AN AWARD

- a. This award is intended for unclassified, publicly releasable research. You will not be granted access to classified information. DOE/NNSA does not expect that the results of the research project will involve classified information. Under certain circumstances, however, a classification review of information originated under the award may be required. The Department may review research work generated under this award at any time to determine if it requires classification.
- b. Executive Order 12958 (60 Fed. Reg. 19,825 (1995)) states that basic scientific research information not clearly related to the national security shall not be classified. Nevertheless, some information concerning (among other things) scientific, technological, or economic matters relating to national security or cryptology may require classification. If you originate information during the course of this award that you believe requires classification, you must promptly:
 1. Notify the DOE Project Officer and the DOE Award Administrator;
 2. Submit the information by registered mail directly to the Director, Office of Classification and Information Control, SO-10.2; U.S. Department of Energy; P.O. Box A; Germantown, MD 20875-0963, for classification review.
 3. Restrict access to the information to the maximum extent possible until you are informed that the information is not classified, but no longer than 30 days after receipt by the Director, Office of Classification and Information Control.
- c. If you originate information concerning the production or utilization of special nuclear material (i.e., plutonium, uranium enriched in the isotope 233 or 235, and any other material so determined under section 51 of the Atomic Energy Act) or nuclear energy, you must:
 1. Notify the DOE Project Officer and the DOE Award Administrator;
 2. Submit the information by registered mail directly to the Director, Office of Classification and Information Control, SO-10.2; U.S. Department of Energy; P. O. Box A; Germantown, MD 20875-0963 for classification review within 180 days of the date the recipient first discovers or first has reason to believe that the information is useful in such production or utilization; and
 3. Restrict access to the information to the maximum extent possible until you are informed that the information is not classified, but no longer than 90 days after receipt by the Director, Office of Classification and Information Control.

d. If DOE determines any of the information requires classification, you agree that the Government may terminate the award by mutual agreement in accordance with 10 CFR 600.25(d). All material deemed to be classified must be forwarded to the DOE, in a manner specified by DOE.

e. If DOE does not respond within the specified time periods, you are under no further obligation to restrict access to the information.

RENEWAL APPLICATIONS *[draft provision that will be finalized upon award]*

I. GENERAL

Renewal applications will be restricted to the current Phase 1 recipients. The determination to select the projects that will proceed beyond Phase 1 will be based upon a competitive selection process occurring prior to the completion of Phase 1. Recipients electing to continue their project beyond Phase 1 will be required to submit a Renewal Application which shall include the Phase 1 Presentation to DOE summarizing Phase 1 results and discusses proposed scope for Phase 2A and 2B activities, with a high-level overview of the proposed approach for Phase 2C and 3 activities.

It is expected that the Renewal Application shall be submitted no later than 60 days prior to the end of Phase 1 – Planning. The anticipated application documents are listed below. **The final application documents and the final Renewal Application process will be defined by way of an amendment to the Phase 1 awards.**

A. Technical Volume
1. Site Suitability
2. Technical Approach
3. Project Organization and Project Management
B. SF 424 – Application for Federal Assistance
C. SF 424A Budget Information
D. Budget Justification File
E. Subaward Budget Information
F. Summary/Abstract for Public Release
G. Authorization for Non-DOE/NNSA or DOE/NNSA FFRDCs
I. SF-LLL Disclosure of Lobbying Activities

II. EVALUATION OF RENEWAL APPLICATIONS

The Phase 1 Topical Report, which is not point scored, will be evaluated to determine the Recipient's overall progress in Phase 1 and the degree to which the Recipient has managed and accomplished the Phase 1 objectives within budget and schedule. The Selection Official may consider the results of this evaluation when making selection. All deliverables identified in the Phase 1 Statement of Project Objectives, including the Phase 1 presentation, will be point scored in accordance with the Merit Review criteria.

A technical evaluation of each Renewal Application will be conducted to determine the merits of the Renewal Application with regard to the potential for success of the proposed project, given (1) the proposed site, (2) the degree to which the organizational structure and management plans can lead to successful operation of the project, and (3) the logic and thoroughness of the technical approach and implementation of Phase 1 operational plans to achieve the objectives of FOA DE-FOA-0000890. Renewal Applications will be evaluated for their quality and completeness. Renewal Applications will be evaluated and numerically scored against the Merit Review criteria. **The final Merit Review Criteria will be defined by way of an amendment to the Phase 1 awards.**

Criterion 1: Site Suitability (Weight: to-be-determined%)

Criterion 2: Technical Approach (Weight: to-be-determined %)

Criterion 3: Project Organization and Project Management Plan (Weight: to-be-determined%)

Basis for Selection and Award of Phases 2 and 3 Renewal Awards

As noted in DE-FOA-0000890, DOE plans to select up to three (3) Renewal Applications to continue beyond Phase 1 based on the decision as to which application is most likely to achieve the program objectives. However, the Selection Official may elect not to select any Renewal application for continuation beyond Phase 1 or may elect to award only a part of a Renewal Application. The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

Selection for negotiations will be made entirely on the basis of Renewal Applications submitted. Renewal Applications should, therefore, specifically address the factors mentioned in the evaluation criteria, and not depend upon reviewers' background knowledge.

DOE may enter into discussions with a selected Applicant for any reason deemed necessary, including, but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) DOE needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by DOE will preclude award to the Applicant.

Upon selection and award of the Renewal Application, the Recipient shall be permitted to commence with Phase 2A activities. A Go/No-Go decision will be made prior to Phase 2B activities based upon the successful completion of Phase 2B activities, as evidenced by completion of all Phase 2A deliverables.

(End of Renewal Application provision)

NOTICE REGARDING THE PURCHASE OF AMERICAN-MADE EQUIPMENT AND PRODUCTS -- SENSE OF CONGRESS

It is the sense of the Congress that, to the greatest extent practicable, all equipment and products purchased with funds made available under this award should be American-made.

LOBBYING RESTRICTIONS (MARCH 2012)

By accepting funds under this award, you agree that none of the funds obligated on the award shall be expended, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 U.S.C. 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

INSOLVENCY, BANKRUPTCY OR RECEIVERSHIP

a. You shall immediately notify the DOE of the occurrence of any of the following events: (i) you or your parent's filing of a voluntary case seeking liquidation or reorganization under the Bankruptcy Act; (ii) your consent to the institution of an involuntary case under the Bankruptcy Act against you or your parent; (iii) the filing of any similar proceeding for or against you or your parent, or its consent to, the dissolution, winding-up or readjustment of your debts, appointment of a receiver, conservator, trustee, or other officer with similar powers over you, under any other applicable state or federal law; or (iv) your insolvency due to your inability to pay your debts generally as they become due.

b. Such notification shall be in writing and shall: (i) specifically set out the details of the occurrence of an event

referenced in paragraph a; (ii) provide the facts surrounding that event; and (iii) provide the impact such event will have on the project being funded by this award.

c. Upon the occurrence of any of the four events described in the first paragraph, DOE reserves the right to conduct a review of your award to determine your compliance with the required elements of the award (including such items as cost share, progress towards technical project objectives, and submission of required reports). If the DOE review determines that there are significant deficiencies or concerns with your performance under the award, DOE reserves the right to impose additional requirements, as needed, including (i) change your payment method; or (ii) institute payment controls.

d. Failure of the Recipient to comply with this term may be considered a material noncompliance of this financial assistance award by the Contracting Officer.

PERFORMANCE OF WORK IN UNITED STATES

The Recipient agrees that at least 100 % of the direct labor cost for the project (including subrecipient labor) shall be incurred in the United States, unless the Recipient can demonstrate to the satisfaction of the Department of Energy that the United States economic interest will be better served through a greater percentage of the work being performed outside the United States.

FFRDC ADVANCE UNDERSTANDING *[if applicable]*

The recipient shall obtain prior written approval from the Contracting Officer having cognizance over the National Laboratory Management and Operating Contract, for use, under this award, of any equipment, facility, or personnel at the National Laboratory. The recipient will be subject to all conditions established by that DOE Contracting Officer.

CATEGORICAL EXCLUSION (CX)

DOE must comply with the National Environmental Policy Act (NEPA) prior to authorizing the use of federal funds. Based on all information provided by the Recipient, DOE has made a NEPA determination by issuing a CX, thereby authorizing use of funds for the defined project activities. If the Recipient later adds to or modifies the activities reviewed and approved under the original DOE NEPA determination, the Recipient must notify the DOE Contracting Officer before proceeding with the new and/or modified activities. Those additions or modifications may be subject to review by the DOE NEPA Compliance Officer and approval by the DOE Contracting Officer, and may require a new NEPA determination.

DECONTAMINATION AND/OR DECOMMISSIONING (D &D) COSTS

Notwithstanding any other terms of this Agreement, the Government shall not be responsible for or have any obligation to the recipient for (i) Decontamination and/or Decommissioning (D&D) of any of the recipient's facilities, or (ii) any costs which may be incurred by the recipient in connection with the D&D of any of its facilities due to the performance of the work under this Agreement, whether said work was performed prior to or subsequent to the effective date of this Agreement.

REPORTING SUBAWARDS AND EXECUTIVE COMPENSATION

a. Reporting of first-tier subawards.

1. Applicability. Unless you are exempt as provided in paragraph d. of this award term, you must report each action that obligates \$25,000 or more in Federal funds that does not include Recovery funds (as defined in section 1512(a)(2) of the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5) for a subaward to an entity (see definitions in paragraph e. of this award term).

2. Where and when to report.

- i. You must report each obligating action described in paragraph a.1. of this award term to <https://www.fsrs.gov/>.
- ii. For subaward information, report no later than the end of the month following the month in which the obligation was made. (For example, if the obligation was made on November 7, 2010, the obligation must be reported by no later than December 31, 2010.)

3. What to report. You must report the information about each obligating action that the submission instructions posted at <https://www.fsrs.gov/> specify.

b. Reporting Total Compensation of Recipient Executives.

1. Applicability and what to report. You must report total compensation for each of your five most highly compensated executives for the preceding completed fiscal year, if

- i. the total Federal funding authorized to date under this award is \$25,000 or more;
- ii. in the preceding fiscal year, you received;
 - (A) 80 percent or more of your annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR 170.320 (and subawards); and
 - (B) \$25,000,000 or more in annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR 170.320 (and subawards); and
- iii. The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/execomp.htm>).

2. Where and when to report. You must report executive total compensation described in paragraph b.1. of this award term:

- i. As part of your registration profile at <https://www.sam.gov>.
- ii. By the end of the month following the month in which this award is made, and annually thereafter.

c. Reporting of Total Compensation of Subrecipient Executives.

1. Applicability and what to report. Unless you are exempt as provided in paragraph d. of this award term, for each first-tier subrecipient under this award, you shall report the names and total compensation of each of the subrecipient's five most highly compensated executives for the subrecipient's preceding completed fiscal year, if;

- i. in the subrecipient's preceding fiscal year, the subrecipient received;
 - (A) 80 percent or more of its annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR 170.320 (and subawards); and
 - (B) \$25,000,000 or more in annual gross revenues from Federal procurement contracts (and subcontracts), and Federal financial assistance subject to the Transparency Act (and subawards); and
- ii. The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/execomp.htm>).

2. Where and when to report. You must report subrecipient executive total compensation described in paragraph c.1. of this award term:

- i. To the recipient.
- ii. By the end of the month following the month during which you make the subaward. For example, if a subaward is obligated on any date during the month of October of a given year (i.e., between October 1 and 31), you must report any required compensation information of the subrecipient by November 30 of that year.

d. Exemptions

If, in the previous tax year, you had gross income, from all sources, under \$300,000, you are exempt from the requirements to report:

- i. Subawards,
- and

ii. The total compensation of the five most highly compensated executives of any subrecipient.

e. Definitions. For purposes of this award term:

1. Entity means all of the following, as defined in 2 CFR Part 25:

- i. A Governmental organization, which is a State, local government, or Indian tribe;
- ii. A foreign public entity;
- iii. A domestic or foreign nonprofit organization;
- iv. A domestic or foreign for-profit organization;
- v. A Federal agency, but only as a subrecipient under an award or subaward to a non-Federal entity.

2. Executive means officers, managing partners, or any other employees in management positions.

3. Subaward:

i. This term means a legal instrument to provide support for the performance of any portion of the substantive project or program for which you received this award and that you as the recipient award to an eligible subrecipient.

ii. The term does not include your procurement of property and services needed to carry out the project or program (for further explanation, see Sec. __ .210 of the attachment to OMB Circular A-133, Audits of States, Local Governments, and Non-Profit Organizations).

iii. A subaward may be provided through any legal agreement, including an agreement that you or a subrecipient considers a contract.

4. Subrecipient means an entity that:

- i. Receives a subaward from you (the recipient) under this award; and
- ii. Is accountable to you for the use of the Federal funds provided by the subaward.

5. Total compensation means the cash and noncash dollar value earned by the executive during the recipient's or subrecipient's preceding fiscal year and includes the following (for more information see 17 CFR 229.402(c)(2)):

i. Salary and bonus.

ii. Awards of stock, stock options, and stock appreciation rights. Use the dollar amount recognized for financial statement reporting purposes with respect to the fiscal year in accordance with the Statement of Financial Accounting Standards No. 123 (Revised 2004) (FAS 123R), Shared Based Payments.

iii. Earnings for services under non-equity incentive plans. This does not include group life, health, hospitalization or medical reimbursement plans that do not discriminate in favor of executives, and are available generally to all salaried employees.

iv. Change in pension value. This is the change in present value of defined benefit and actuarial pension plans.

v. Above-market earnings on deferred compensation which is not tax-qualified.

vi. Other compensation, if the aggregate value of all such other compensation (e.g. severance, termination payments, value of life insurance paid on behalf of the employee, perquisites or property) for the executive exceeds \$10,000.

CENTRAL CONTRACTOR REGISTRY AND UNIVERSAL IDENTIFIER REQUIREMENTS

A. Requirement for Registration in the System for Award Management (SAM)

Unless you are exempted from this requirement under 2 CFR 25.110, you as the recipient must maintain the currency of your information in SAM until you submit the final financial report required under this award or receive the final payment, whichever is later. This requires that you review and update the information at least annually after the initial registration, and more frequently if required by changes in your information or another award term.

If you had an active registration in the CCR, you have an active registration in SAM.

B. Requirement for Data Universal Numbering System (DUNS) Numbers

If you are authorized to make subawards under this award, you:

1. Must notify potential subrecipients that no entity (see definition in paragraph C of this award term) may receive a

subaward from you unless the entity has provided its DUNS number to you.

2. May not make a subaward to an entity unless the entity has provided its DUNS number to you.

C. Definitions

For purposes of this award term:

1. System for Award Management (SAM) means the Federal repository into which an entity must provide information required for the conduct of business as a recipient. Additional information about registration procedures may be found at the SAM Internet site (currently at <https://www.sam.gov>).

2. Data Universal Numbering System (DUNS) number means the nine-digit number established and assigned by Dun and Bradstreet, Inc. (D&B) to uniquely identify business entities. A DUNS number may be obtained from D&B by telephone (currently 866-705-5711) or the Internet (currently at <http://fedgov.dnb.com/webform>).

3. Entity, as it is used in this award term, means all of the following, as defined at 2 CFR part 25, subpart C:

- a. A Governmental organization, which is a State, local government, or Indian Tribe;
- b. A foreign public entity;
- c. A domestic or foreign nonprofit organization;
- d. A domestic or foreign for-profit organization; and
- e. A Federal agency, but only as a subrecipient under an award or subaward to a non-Federal entity.

4. Subaward:

- a. This term means a legal instrument to provide support for the performance of any portion of the substantive project or program for which you received this award and that you as the recipient award to an eligible subrecipient.
- b. The term does not include your procurement of property and services needed to carry out the project or program (for further explanation, see Sec. __.210 of the attachment to OMB Circular A-133, Audits of States, Local Governments, and Non-Profit Organizations).
- c. A subaward may be provided through any legal agreement, including an agreement that you consider a contract.

5. Subrecipient means an entity that:

- a. Receives a subaward from you under this award; and
- b. Is accountable to you for the use of the Federal funds provided by the subaward.

FINAL INCURRED COST AUDIT

In accordance with 10 CFR 600, DOE reserves the right to initiate a final incurred cost audit on this award. If the audit has not been performed or completed prior to the closeout of the award, DOE retains the right to recover an appropriate amount after fully considering the recommendations on disallowed costs resulting from the final audit.

PROPERTY

Real property, and equipment acquired by the Recipient shall be subject to the rules set forth in 10 CFR 600.130-137, 10 CFR 600.231-233, or 10 CFR 600.320-324 as applicable.

Consistent with the goals and objectives of this project, the Recipient may continue to use Recipient acquired property beyond the Period of Performance, without obligation, during the period of such use, to extinguish DOE's conditional title to such property as described in 10 CFR 600.132-135, 10 CFR 600.231-233, 600.321-324, subject to the following: (a) the Recipient continues to utilize such property for the objectives of the project as set forth in the Statement of Project Objectives; (b) DOE retains the right to periodically ask for, and the Recipient agrees to provide, reasonable information concerning the use and condition of the property; and (c) the Recipient follows the property disposition rules set forth in the applicable sections of 10 CFR Part 600, if the property is no longer used by the Recipient for the objectives of the project, and the fair market value of property exceeds \$5,000.

Once the per unit fair market value of the property is less than \$5,000, pursuant to the applicable sections of 10 CFR

Part 600, DOE's residual interest in the property shall be extinguished and Recipient shall have no further obligation to the DOE with respect to the property.

The regulations as set forth in 10 CFR Part 600 and the requirements of this article shall also apply to property in the possession of any team member, sub-recipient or other entity where such property was acquired in whole in part with funds provided by DOE under this grant or where such property was counted as cost-sharing under the grant.

INDEMNITY

The Recipient shall indemnify the Government and its officers, agents, or employees for any and all liability, including litigation expenses and attorneys' fees, arising from suits, actions, or claims of any character for death, bodily injury, or loss of or damage to property or to the environment, resulting from the project, except to the extent that such liability results from the direct fault or negligence of Government officers, agents or employees, or to the extent such liability may be covered by applicable allowable costs provisions.

SUBAWARDS TO DOE NATIONAL LABORATORIES *[if applicable]*

For the purposes of the subaward(s) to [Insert Name of Laboratory], the recipient shall use the Department's Work for Others program and the terms and conditions established for that program.

LOBBYING RESTRICTIONS (MARCH 2012)

By accepting funds under this award, you agree that none of the funds obligated on the award shall be expended, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 U.S.C. 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

CORPORATE FELONY CONVICTION AND FEDERAL TAX LIABILITY ASSURANCES (MARCH 2012)

By entering into this agreement, the undersigned attests that [insert corporation name] has not been convicted of a felony criminal violation under Federal law in the 24 months preceding the date of signature.

By entering into this agreement, the undersigned attests that no agent or officer of [insert corporation name] has been convicted of a felony offense, arising out of actions for or on behalf of the corporation, under Federal law in the 24 months preceding the date of signature.

The undersigned further attests that [insert corporation name] does not have any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. For purposes of these assurances, the following definitions apply:

A Corporation includes any entity that has filed articles of incorporation in any of the 50 states, the District of Columbia, or the various territories of the United States [but not foreign corporations]. It includes both for-profit and non-profit organizations.

FOREIGN NATIONAL INVOLVEMENT

The Recipient may be required to provide information to the Department of Energy (DOE) in order to facilitate our responsibilities associated with foreign national access to DOE sites, information, technologies, and equipment. Foreign national is defined as any person who was born outside the jurisdiction of the United States, is a citizen of a foreign government, and has not been naturalized under U.S. law. If the Recipient, including subrecipients/contractors, anticipates utilizing a foreign national person in the performance of an award, the Recipient may be responsible for providing to the DOE representative specific information of the foreign national(s) to satisfy compliance with all of the requirements for access approval.

CONFERENCE SPENDING (APRIL 2013)

The Recipient shall not expend funds for the purpose of defraying the cost to the United States Government of a conference [described in subsection (c) of the Consolidated and Further Continuing Appropriations Act, 2013] that was more than \$20,000, or circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to the Inspector General or senior ethics official for any entity without an Inspector General, of the date, location, and number of employees attending such conference that is not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded.

Attachment 8 – Example Technology Collaboration Agreement (TCA)

1. Introductory paragraphs:
 - Name and location of parties
 - Effective date
 - Description of technology to be tested
 - Description of any applicable government and/or funder contract
 - Description of collaborative work to be performed
2. Terms of TCA:
 - Project responsibilities:
 - Specific activities that each party shall be responsible for performing
 - Schedule and Work Plan for the project
 - Designate authorized representatives
 - Costs and Expenses:
 - Responsibility for costs and expenses associated with project responsibilities
 - Term and Termination:
 - Term of the agreement
 - Termination for convenience and for cause provisions
 - Parties' respective duties in winding-up the project in the event of termination
 - Termination for breach – misrepresentations, untimely work, material default of provisions of TCA, etc.
 - Notice of default/right to cure – provide written notice of breach and afford certain period of time to cure.
 - Reservation of right to pursue all civil remedies
 - Intellectual Property:
 - Right, title and interest in Intellectual Property
 - Assignability/transferability/licensing of rights to IP.
 - Rights to IP developed throughout the course of the project
 - Right, title and interest in and to the data and information concerning the performance of the Technology and other technical information that is generated throughout the course of the project
 - Data Rights:
 - Define Data (technical, proprietary, confidential), including, but not limited to, all Data types listed in the Example Site Characterization Data Addendum (Attachment 3)
 - Treatment of Data, including Data archiving and curation via a FORGE Data System/Node compatible with the National Geothermal Data System (NGDS)
 - Access to Data (who, when, what, how)
 - Disclosure of Data (who, when, what, how)
 - Protection of Data (reasonable efforts)
 - Damages (irreparable harm) for unauthorized disclosure
 - Written notice before disclosure to third parties
 - Liability and Indemnity
 - Warranty
 - Insurance

- Site Access (if applicable)
- Subcontractors
- No Waiver Provision
- Survival
- Governing Law and Jurisdiction
- Cumulative Remedies
- Independent Entities
- Publicity of project
- Authority
- Successors and Assigns
- Notices
- Force Majeure
- Multiple Originals
- Entire Agreement/Merger Clause

3. Exhibits:

- A. Detailed description of project responsibilities
- B. Applicable government contract flowdowns
- C. Classification of Data – data buckets developed by technical teams from each party, conforming with existing or newly developed content models compatible with NGDS
- D. Site Access Provisions (if applicable), security procedures, drug/alcohol testing requirements
- E. IP data listings for third party testing (to be provided to DOE/funder, if applicable)