

April 29, 2022

MEMORANDUM FOR NEPA FILE  
FROM:   
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NEPA DOCUMENT MANAGER

SUBJECT: Supplement Analysis for Frontier Observatory for Research into  
Geothermal Energy (FORGE) (DOE/EA-2070)

New Information: Proposed Modification to Project  
Location: Milford, Utah  
Proposer: Energy and Geoscience Institute (EGI), University of Utah

### 1. Introduction

In March 2018, the Department of Energy (DOE) issued DOE/EA-2070, *Final Environmental Assessment for Frontier Observatory for Research into Geothermal Energy, Milford, Utah*. A Finding of No Significant Impact (FONSI) was issued by DOE in April 2018, based on the Final Environmental Assessment (EA). DOE's proposed action consisted of providing EGI with cost-shared financial assistance. The University of Utah EGI team would use their portion of the financial assistance to fully instrument, characterize, and permit the Utah FORGE site for a field laboratory to conduct cutting-edge research on enhanced geothermal systems (EGS). The DOE funds obligated to date are approximately \$187M, for both the construction of the FORGE site and the funding of research projects by the subsurface scientific and energy community.

The FORGE program was designed to establish a dedicated field laboratory site where the subsurface scientific and engineering community would develop, test, and improve technologies and techniques for the creation of cost-effective and sustainable EGS in a controlled, ideal environment. The Utah FORGE site is approximately 10 miles northeast of Milford in Beaver County, Utah, on private, State of Utah School and Institutional Trust Lands Administration (SITLA), and U.S. Bureau of Land Management (BLM) lands.

The original scope of the project included deep geothermal research wells, monitoring wells, groundwater wells, a modular office structure, utility tie-ins, and monitoring equipment. The original site configuration and seismic survey corridors were analyzed in the EA. See (Figure 1).

EGI proposes to conduct additional work inside that site boundary, including the use of seismic survey equipment in the project area shown in Figure 2, and the drilling of 3 shallow seismic boreholes on SITLA-managed lands. These boreholes would be approximately 150 feet deep with seismic monitoring instruments installed at the bottom. Figure 2 shows the location of the additional seismic surveys and the locations of the seismic boreholes. An evaluation of the possible environmental effects of the proposed seismic monitoring activity is the subject of this Supplement Analysis.

## 2. NEPA Analysis to Date

DOE completed its environmental review for FORGE with the issuance of a Final EA (DOE/EA-2070) in March 2018, followed by the issuance of a FONSI in April 2018. The EA was prepared in accordance with the Council on Environmental Quality's *National Environmental Policy Act* (NEPA) regulations (40 CFR Parts 1500 to 1508) and DOE implementing regulations (10 CFR Part 1021).

The EA analyzed the potential environmental impacts of providing cost-shared funding to EGI to facilitate the development of a field laboratory site where the subsurface science and engineering community would develop, test, and improve technologies and techniques for EGS.

DOE examined the potential impacts on the following resources and found none to be significant: air quality; geology and soils; water resources; terrestrial vegetation; wildlife; threatened and endangered species; socioeconomic resources; infrastructure/utilities; noise; human health and safety; and waste management. Field surveys of cultural/archaeological resources along the seismic survey lines were conducted to ensure that no cultural or archaeological resources would be impacted. The following additional issues or resources were considered but dismissed from detailed analysis due to the lack of potential impacts: groundwater; wetlands/floodplains; land use; and environmental justice.

As part of the original assessment, DOE conducted formal consultations by mail with the responsible U.S. Fish and Wildlife Service (USFWS) field office, State Historic Preservation Office, and Native American Tribal contacts. DOE received correspondence supporting a determination of no potential impacts to federally-listed threatened or endangered species or their habitats. Correspondence was also received from the Utah State Historic Preservation Office supporting a determination of no potential impacts to properties listed on or eligible for inclusion in the National Register of Historic Places.

In addition, DOE incorporated an Environmental Assessment (DOI-BLM-UT-C010-2016-0042-EA) completed by the BLM regarding the location of the seismic survey lines. The EA required a Class III archaeological survey of the seismic survey lines. The archaeological survey was completed in 2016 and BLM issued the permit to conduct seismic work along those lines. The seismic survey lines are shown in Figure 1.

### 3. Description of Proposed Project Changes

There are two changes to the project.

- 1) Additional land has been surveyed for cultural resources on SITLA managed property leased to Utah FORGE above and adjacent to the surface trajectory of deep, deviated well 16A(78)-32 (Figure 3). Well 16A(78)-32 will be used as the injection well, and a proposed production well (16B(78)-32) will closely mimic its geometry. This injection-production well doublet will be the centerpiece of the Utah FORGE EGS project with the majority of site activities concentrated within these two wells. These additional surveys facilitate growth of the underground research infrastructure required to create an EGS reservoir, including: 1) construction of deep, microseismic monitoring wells (56-32, 78B-32 and a future well); 2) deep wells to test tools/equipment/techniques within the reservoir (78B-32 and a future well); 3) and the deployment of monitoring instrumentation on the surface. SITLA required additional Class III archaeological surveys that were completed in 2020 and 2021 with a finding of no adverse effect issued by SHPO.
- 2) Additionally, three seismic wells (FSB4, FSB5, and FSB6) were proposed on SITLA owned land outside of the Utah FORGE footprint. The locations of these three boreholes are found in Figure 4. These boreholes would be approximately 150 feet deep with seismic monitoring instruments installed at the bottom. To construct these wells a 50' by 75' drill pad would need to be cleared of vegetation. The wells would be small diameter (< 6") and watertight. The proposed drill sites are located next to existing roads so that no improvement of access roads would be required. The final surface installation has a small footprint with the wellhead protruding a few feet from the ground, buried barrels to house electronic equipment, a mast for solar panels and data transmission equipment and a small fence to keep out wildlife/livestock. A reference photo of a previously completed seismic well is included as Figure 5. SITLA required a biological resources habitat assessment and archaeological survey for the proposed well locations. The surveys were completed in February 2022, and the SHPO issued a finding of no adverse effect.

### 4. Analysis

- The EA analyzed potential impacts associated with fully instrumenting, characterizing, and permitting the Utah FORGE site for a field laboratory to conduct cutting-edge research on enhanced geothermal systems. The analysis did not identify any significant adverse impacts to air quality; geology and soils; water resources; terrestrial vegetation; wildlife; threatened and endangered species; socioeconomic resources; infrastructure/utilities; noise; human health and safety; or waste management.
- The proposed modifications are related to characterizing the subsurface geology of the FORGE site. The additional areas cleared above and

adjacent to the 16A(78)-32 trajectory, as well as the installation of three seismic wells would not significantly impact any of the resource areas evaluated in the EA. The new locations were surveyed for biological habitat and cultural/archaeological resources, and no impacts were found.

- The proposed additional areas would result in only a minor, temporary change to the analysis of air quality impacts. No additional equipment or emission sources would be permanently added. A small increase in air emissions from a drill rig may occur for a short duration during construction of the three shallow boreholes at FSB4, FSB5, and FSB6.
- The proposed seismic wells would result in a minor, temporary change during the drilling of the shallow wells.

#### 5. Findings

The proposed scope changes would not significantly change the analysis of impacts for any of the resource areas evaluated in the EA. DOE has therefore determined that the proposed change to the project falls within the scope of analyses documented in the EA completed in April 2010. DOE has further determined that the potential impacts that may be associated with EGI's proposed project, as well as the proposed change to that project, have been adequately evaluated by the EA and FONSI issued in April 2018. These findings remain valid, and therefore, a supplement to the EA, or any other additional NEPA analysis, is not needed at this time.

Figure 1. Site diagram as published in the Environmental Assessment.

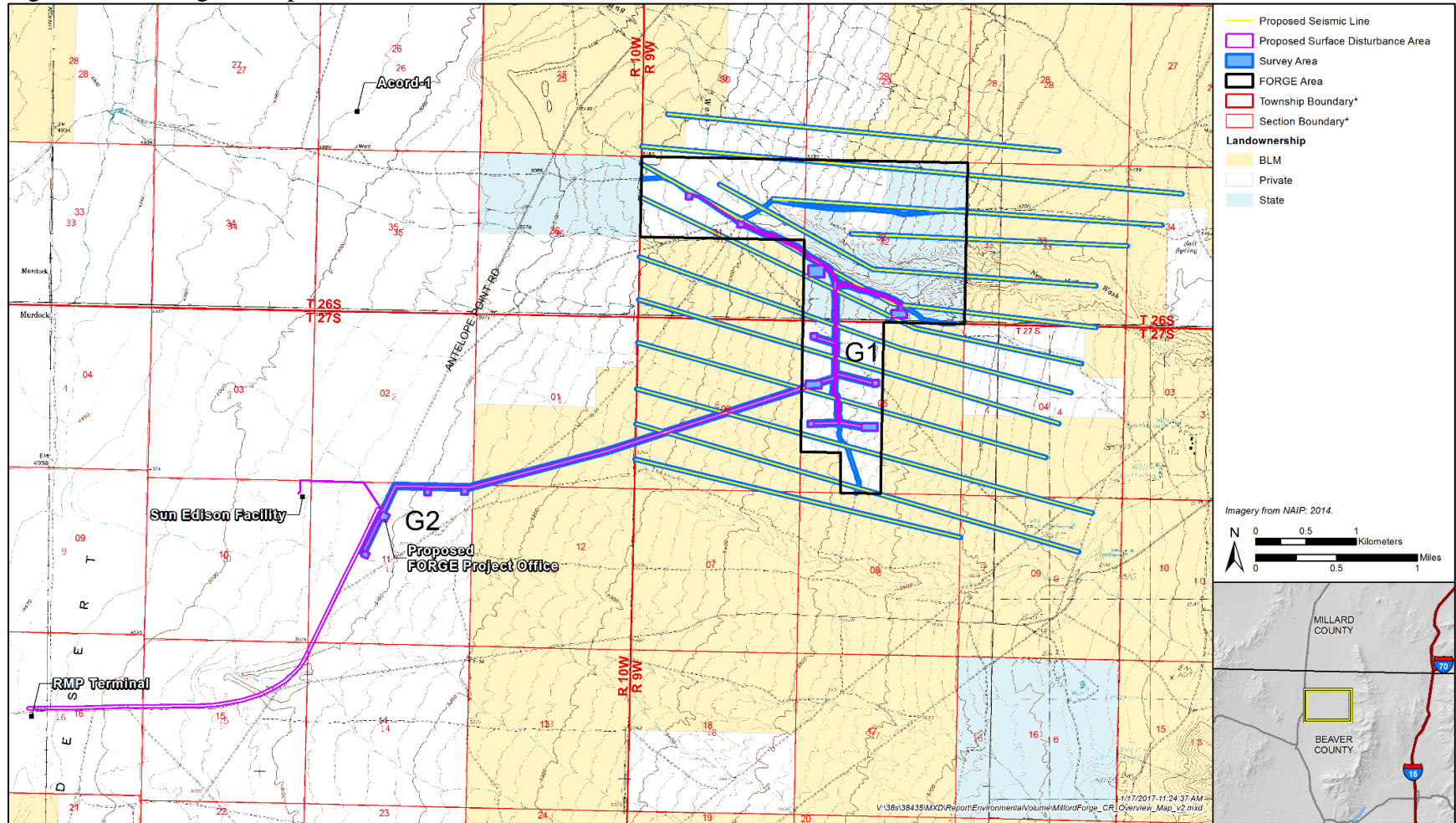




Figure 2. Site diagram with additional seismic study areas (change indicated in pink)

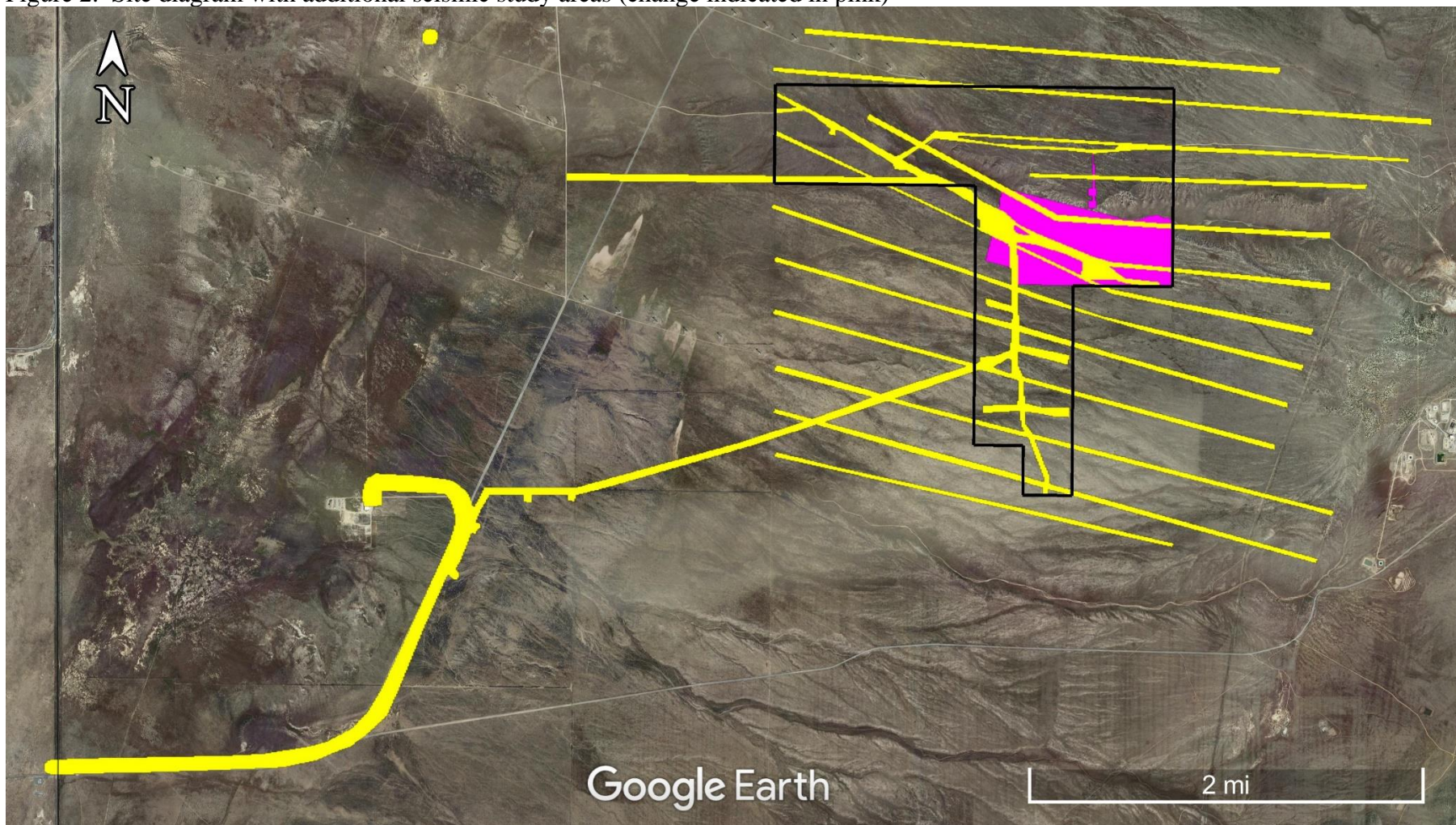




Figure 3. Land ownership, culturally cleared land, deep wells constructed to date and the surface trajectory of deep, deviated well 16A(78)-32.

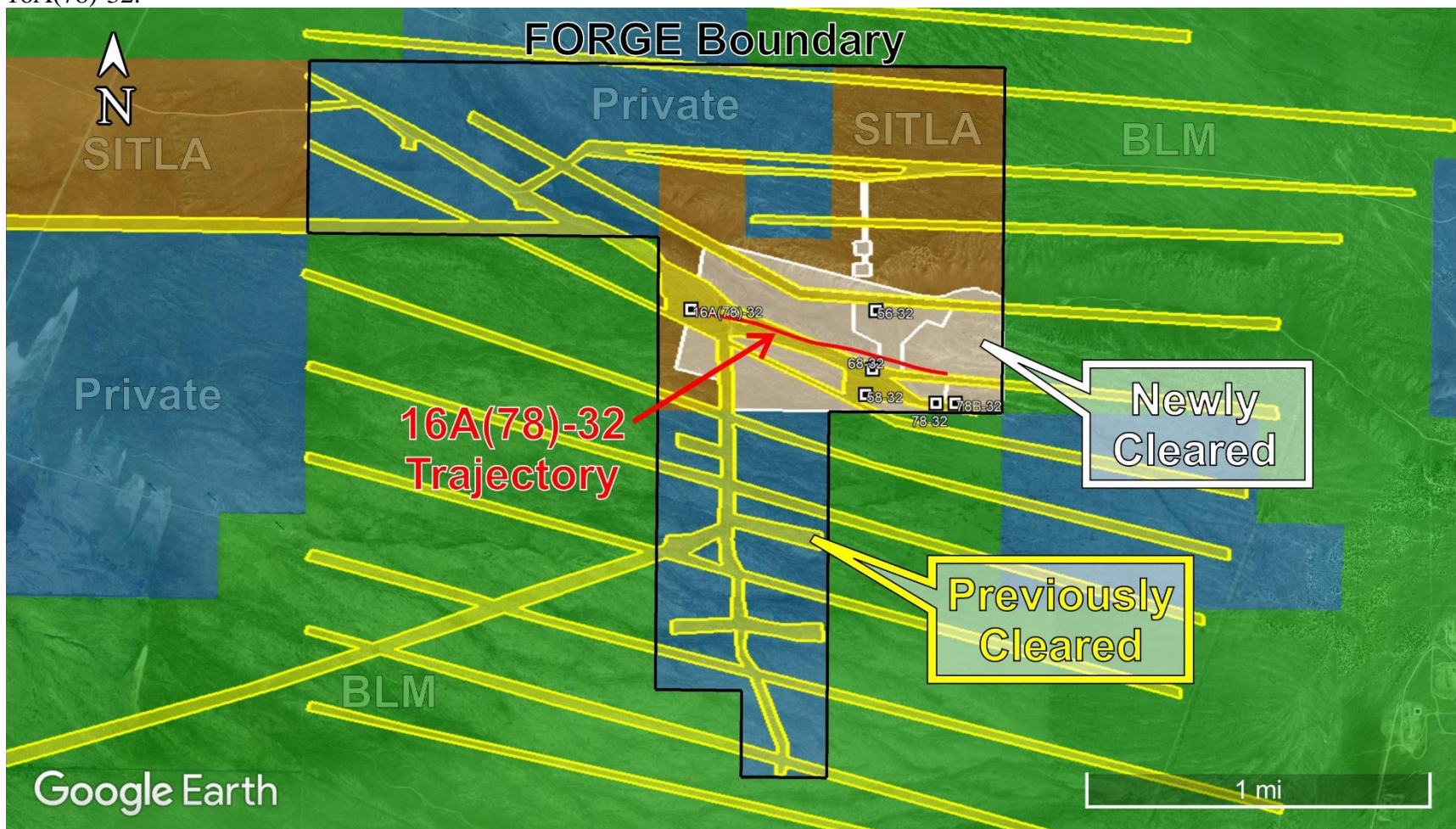


Figure 4. Seismic monitoring wells located on SITLA land (FSB4, FSB5, and FSB6). The Utah FORGE footprint is shown in blue.





Figure 5. A previously completed seismic monitoring well.

