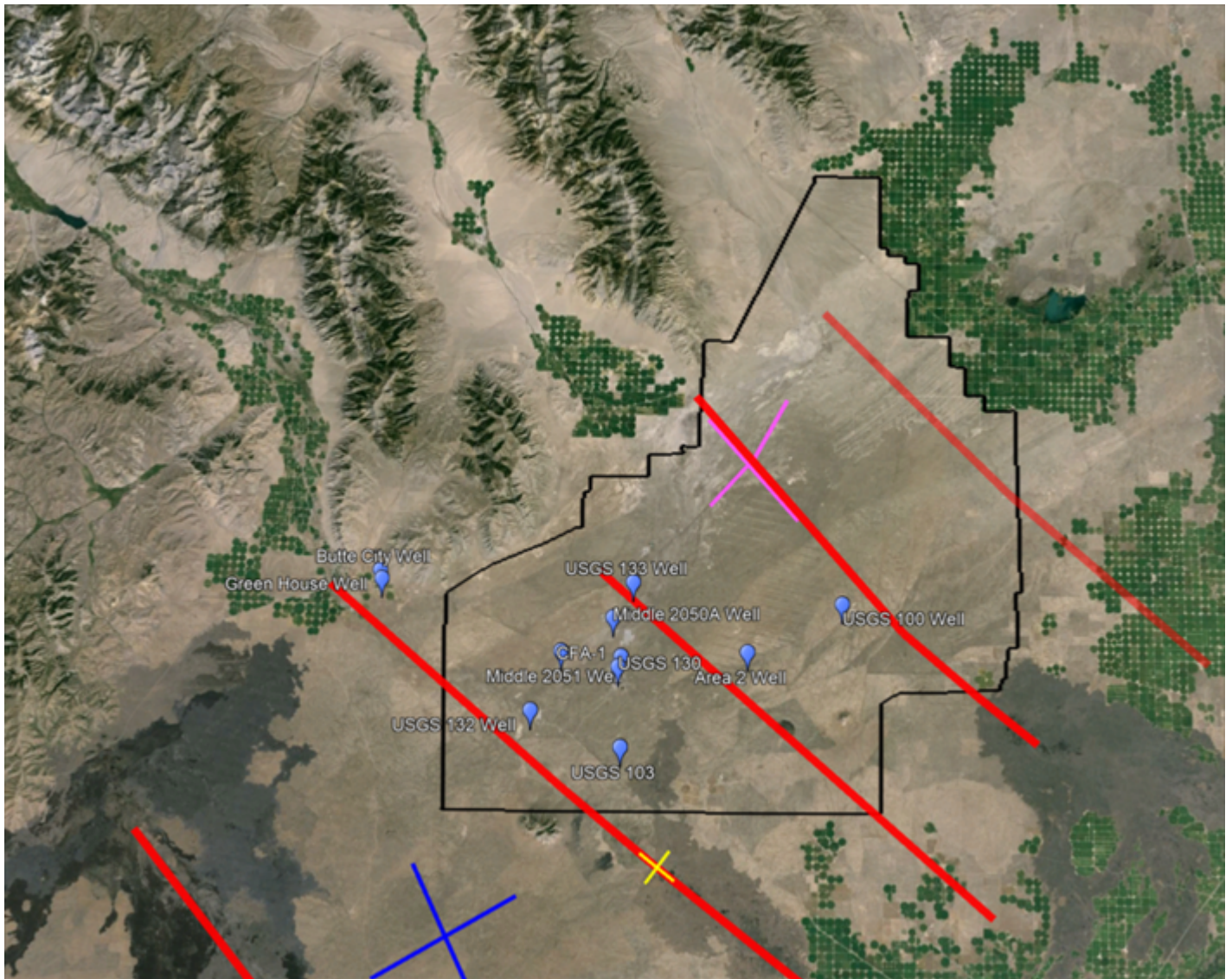


**SECTION A. Project Title:** Geological Hydrogen Characterization in the Eastern Snake River Plain

**SECTION B. Project Description and Purpose:**

The proposed project explores geological hydrogen by measuring geological hydrogen seepage rates across Eastern Snake River Plain (ESRP) to understand the potential for geological hydrogen production. Geological hydrogen holds the potential to meet the Department of Energy (DOE) Hydrogen Earthshot goals, which aims to reduce the cost of clean hydrogen (H<sub>2</sub>) by 80% to \$1 per 1 kilogram in 1 decade ("111"). Oxidation of water Iron (II) in rock with water is a major generation mechanism for geological hydrogen. The iron (II)-rich basalt formation near-surface in the Eastern Snake River Plain (ESRP) hold promise for producing hydrogen at the industrial scale. Work will involve groundwater sampling from submersible pumps and springs and hydrogen sampling. Hydrogen will be characterized on site using hydrogen sensors. Approximately 10 different soil samples will also be collected, each sample with a size of ~ 0.5 kg (~1 lb). A fraction of these soil samples will be used for characterization work. All these samples will be collected from non-Resource Conservation and Recovery Act (RCRA) area and will have no adverse environmental issues. Any leftover samples will be disposed of in the lab trash after the completion of the project. Samples will be collected from near-surface (5-10 inches) environment. Sampling will be done by a hand-auger and does not require deep and major excavation. Samples will be transported to the Center for Advanced Energy Studies (CAES) lab for storage and delivery to Pristine Energy for analysis.

Work will be completed at Central Facilities (CFA) CF-719 or CFA-1 well and CAES. Figure 1 and Table 1 show the remaining sampling locations.



**Figure 1.** Map of Sampling Locations

The blue points identify the sampling locations on the INL site which intersects with the ESRP.

**Table 1.** Sampling Locations with Coordinates

Sampling Location	Latitude	Longitude
Butte City Well	43°36'30.70"N	113°14'40.65"W
Green House Well	43°36'3.03"N	113°14'30.51"W
USGS 133	43°36'5.00"N	112°55'43.00"W
Middle 2050A	43°34'9.00"N	112°57'5.00"W

CFA-1	43°32'3.41"N	112°56'22.41"W
USGS 130	43°31'30.56"N	112°56'33.21"W
Middle 2051	43°32'17.00"N	113° 0'49.00"W
USGS 132	43°29'6.00"N	113° 2'50.00"W
USGS 103	43°27'14.00"N	112°56'7.00"W
Area 2	43°32'22.92"N	112°47'2.04"W
USGS 100	43°35'3.12"N	112°40'5.88"W

**Tasks include:**

INL (Leading):

- Hydrogen seepage rate measurement: Hydrogen sensors are to be obtained to rate in situ.
- Collect gas/fluid samples from the field. The monitoring systems that will be installed may require local hand digging with a shovel and anchoring with stakes or nails in the shallow soils. The soil depth will be 30cm from the soil surface. Other disturbances may include vehicular traffic on established dirt roads.
- Data will be provided to Pristine Energy Inc. for the evaluation of hydrogen production feasibility in the ESRP region.

CAES (Supporting):

- Use lab equipment (e.g., Gas Chromatography) to have high accuracy data.
- Hydrogen potential assessment: Characterization to build a numerical model and perform numerical simulation using the high-performance computational clusters.
- Split samples (fluid, gas, rock) may be stored locally in the CAES Geochemistry Laboratory for the duration of the project.

Pristine Energy (Supporting):

- Analysis of samples

**Waste may include:**

INL:

- Waste will be generated in association with this project, refer to the Aspects & Impacts section for additional information.

CAES:

- Laboratory personal protection equipment, wipes, etc.
- Disposition of the samples will occur according to established CAES procedures and protocols.

Pristine Energy:

- Samples will be collected and dispositioned will be performed by Pristine Energy after their evaluation.

Waste will be managed according to facility specific requirements.

All off-site partners will comply with their local procedures and state/federal regulations as identified in contract agreements.

**SECTION C. Environmental Aspects or Potential Sources of Impact:**

**Air Emissions**

Project activities may generate fugitive dust.

**Discharging to Surface-, Storm-, or Ground Water**

NA

**Disturbing Cultural or Biological Resources**

There is the potential for this work to impact vegetation and for project personnel to interact with various wildlife species. A Biological Resource Review will be arranged within two weeks prior to the initiation of any activities that might disturb soil or vegetation and again following completion of project activities. A nesting bird survey is included with the Biological Resource Review for actions occurring between April 1 - October 1 per compliance with the Migratory Bird Treaty Act. Bat surveys are also included with the Biological Resource Review in accordance with the INL Bat Protection Plan.

Cultural: Pursuant to the 2023 Programmatic Agreement, this federal undertaking is excluded from Section 106 review and the proposed activity results in no historic properties affected.

**Generating and Managing Waste**

General field Personal Protective Equipment (PPE) gloves and various paper towels, plastics, etc. (~ 1-2 garbage bags of materials.)

Disposition of the samples will occur according to established INL procedures and protocols and through waste generator services (WGS).

**Releasing Contaminants**

When chemicals are used during the project there is the potential for spills that could impact the environment (air, water, soil).

**Using, Reusing, and Conserving Natural Resources**

Project description indicates materials will need to be purchased or used that require sourcing materials from the environment. Being conscientious about the types of materials used could reduce the impact to our natural resources.

**Environmental Justice**

According to the CEQ Climate and Economic Justice Screening Tool, the INL site as well as the Research and Education Campus in Idaho Falls, ID are located in U.S. Census tracts that are identified as disadvantaged communities. Census tracts identified as disadvantaged meet or exceed socioeconomic, environmental, health, or demographic thresholds identified by CEQ. Given that activities analyzed in this document will happen within the boundaries of existing DOE/INL land and/or facilities where there are no permanent residents, any impacts to Environmental Justice in surrounding communities are anticipated to be negligible.

**DOE-ID NEPA CX DETERMINATION**  
**Idaho National Laboratory**

**SECTION D. Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification:** Identify the applicable categorical exclusion from 10 Code of Federal Regulation (CFR) 1021, Appendix B, give the appropriate justification, and the approval date.

For Categorical Exclusions (CXs), the proposed action must not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, or similar requirements of Department of Energy (DOE) or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment or facilities; (3) disturb hazardous substances, pollutants, contaminants, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

**References:** B3.1 "Site characterization and environmental monitoring"

**Justification:** JUSTIFICATION: Based on the purpose and need and description of the proposed action and potential environmental impacts, the proposed action fits within the class of actions that is listed in Appendix B CX B3.1. There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal. The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)) and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Authorizing the proposed action will not (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including DOE and/or Executive orders; (2) require siting of new facilities or expansion of existing facilities; (3) disturb hazardous substances, pollutants, or contaminants; (4) adversely affect environmentally sensitive resources; or (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act)     Yes     No

Approved by Robert Douglas Herzog, DOE-ID NEPA Compliance Officer on: 9/10/2024