2012 Geothermal Technologies Student Competition

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Geothermal Project Title: Geothermal Assessment of The Snake River Plain

Approach and Methodology

The Snake River Plain is a large, geologically complex, and relatively unexplored area for enhanced geothermal system (EGS) development. As a target area, this presents many challenges for a small group with limited resources. Therefore this proposal focuses on maximizing the utility of geoscience efforts through computer-based tools that allow potential investment decisions to be evaluated on the basis of economic and technical constraints. The core focus of UT-Austin's proposal is an integrated decision analysis model that will evaluate the Snake River plain region on three primary criteria: geological setting, infrastructure proximity, and economic feasibility. After this initial modeling phase, a field visit to conduct surface mapping and collect geochemical data will be conducted. Geological conditions will be assessed primarily using geochemical analysis, geothermometry, and surface mapping. This will be augmented with publicly available satellite imaging and localized electrical/magnetic resistivity methods. In addition to physical geological constraints, development of geothermal energy in the Snake River plain is highly dependent on access to existing infrastructure and economic conditions. Proximity to existing transmission infrastructure, road access, demography, electricity price, and cost of exploration will be visualized using ArcMap and Tableau software packages. These tools will be used to locate "buffer zones" around critical infrastructure in which geothermal resource development is economically feasible. Economic feasibility will be assessed by using faulting and fracturing characteristics found at the surface north of the three major volcanic provinces, the Twin Falls, Picabo and Heise Calderas, to come up with a potential model for what a reservoir system will look like at depth. This will be used to determine a potential range of production values as well as a range of NPV's for site specific projects. In this way the economic potential for these resources can be assessed and will allow clarity in decision making with regards to going forward with development. This model will be a tool for decision makers and should not be confused with an accurate representation of the characteristics of reservoirs at depth. The final component of this investigation will be a social impact assessment based on social science data gathered in the field. This includes conducting interviews with key stakeholders and identifying potential impacts of geothermal development. The goal of this data gathering will be to define the framework for a decision support model in the case of further development. Finally, this data will be integrated into a GIS system to

produce a “target map” for use by potential developers. This final product will comply with the US Geoscience Information Network (USGIN) protocols for data sharing.