

GEOHERMAL RESOURCES ASSESSMENT PROGRAM

GEOSCIENCES PROPOSAL

Submitted By:

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Geology Program

The geology program will have three major responsibilities: core curation and distribution, analysis of whole rock chemistry, and analysis of secondary mineralogy. Core curation, as used here, consists of: preparation of a detailed description of the core that can be used for sampling and for analysis of gross trends in the rock structure and morphology; providing a more general or summary description that can be used for routine characterization of the drilling results; preparation of the core for distribution to analysts conducting detailed studies of the core; and preservation of access to the core for studies that may be conducted in the future.

At the present time, only a detailed description of the core is available. Preparation of a more generalized summary of the core results has not yet been compiled nor are the detailed descriptions in a form that is easily accessible to interested investigators. These will be the priority tasks of the core curator under this program: both graphical and written summaries will be prepared for all holes that will include rock type/characteristics, corresponding temperature profiles, and pertinent drilling data for each hole. Entry of core description data into a data base will be conducted to allow the relevant characteristics of the core to be identified and accessed from the detailed core descriptions in an effective manner. This work is presently underway and can be largely accomplished with student help under the supervision of the core curator.

Preservation of the core for future access consists of basic oversight of the core sampling process to ensure that some sections of core are not sampled to extinction or needlessly over-sampled. In order to ensure that a portion of the core is preserved, all the core will be split with one half being preserved for archive and the remaining half prepared for distribution. This work can also be done by student help under the supervision of the core curator.

At the present time, two proposals have been presented for analysis of the core: whole rock chemical analysis will be conducted to define the gross trends of alteration within the core

and to attempt to determine whether the rocks sampled are exclusively from Kilauea or whether any of the drill holes may have penetrated Mauna Loa Volcano. A second aspect of this proposal will be an analysis of fluid inclusions found within the altered portions of the holes. Analysis of the freeze/thaw temperatures of the inclusions will enable us to estimate the salinity of the fluids circulated within the rift and the relative occurrences of saline versus fresh water alteration episodes as well as their locations along the rift.

The second proposal, a study of secondary mineralization within the cores, will provide better definition of the types and locations of secondary mineralization that have occurred within each of the drill holes. With this type of analysis we will be able to determine whether the fluids circulating within the rift were derived from predominantly saline or fresh water sources; this information will be critical for estimating the economics of large scale development of this resource. We also hope to be able to determine whether the observed alteration is derived from a continuous period of hydrothermal alteration or whether permeability conditions evolved so rapidly that many short episodes of fluid entry were required to circulate the necessary volumes of fluid through the rock to generate the observed alteration patterns.

Budget

The curation effort will require the services of a full time curator as well as two student helpers at approximately one-half time FTE. There will be minimal additional costs for supplies associated with core preservation and preparation for distribution. Travel costs will be associated with having the curator attend meetings on Oahu and for travel to the mainland for presentation of the results at national meetings.

The budgets for the whole rock geochemistry and the secondary mineralogy analyses are attached.