

## A Proposal

for the

### CHEMICAL AND MINERALOGICAL CHARACTERIZATION OF SOH CORES

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#### *Proposed Work*

We propose to provide chemical analyses and petrographic descriptions of selected samples from State of Hawaii Scientific Observation Holes 1, 2 and 4. To date a total of about 15,000' of core has been recovered from these three holes. This work will involve the following tasks:

1. Sub-sampling of the core. About 15-25 grams of rock are required for the analytical work on each sample. Samples will be taken only from the working half of the core. This work will be performed by T. Hulsebosch in consultation with other interested individuals, possibly including D. Thomas, M. Sykes, H. West and/or others.
2. Preparation of a thin section. For each sample a 1" X 2" slab will be cut and submitted to the SOEST Thin Section Facility for fabrication of a thin section.
3. Preparation of rock powder and XRF samples. The remainder of each sub-sample will be crushed in a WC mill to a fine powder. These powders will then be prepared as fused discs and pressed powder pellets for XRF analysis.
4. Analysis by XRF. For each sample we will provide quantitative chemical data for SiO<sub>2</sub>, TiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>\* (total Fe as Fe<sub>2</sub>O<sub>3</sub>), MnO, MgO, CaO, Na<sub>2</sub>O, K<sub>2</sub>O, P<sub>2</sub>O<sub>5</sub>, LOI (loss on ignition at 950°C), Sc, V, Cr, Ni, Cu, Zn, Rb, Sr, Y, Zr, Nb, Ba, La, Ce, Pb, Th, and U. The analyses will be run on the Siemens 303AS, wavelength-dispersive X-ray fluorescence spectrometer system at the University of Hawaii.
5. Petrographic description. We will provide a description of each sample that will include textures, and igneous and alteration mineralogy.

#### *Costs*

The following costs are per sample rates attached to the tasks outlined above.

1. Core sub-sampling and sample preparation	\$70
2. XRF major and trace element analysis	50
3. Thin section preparation and description	<u>30</u>
Total per sample	150

### *Number of Samples*

The number of samples per core will ultimately determine the value of this reconnaissance characterization. Detailed scientific studies should sample every flow unit (typically 1-10'). Following discussions with several persons familiar with Hawaiian stratigraphy we propose that an average sample spacing for this study be about one every 50'. The exact location of each sample will be made based on observed variability within each core. For the sake of preparing a budget we suggest that an average 50' sampling interval will provide a good first-order characterization of the down-hole variability without compromising later proposals to outside funding agencies. This spacing over 15,000' of core give 300 samples to be analyzed. At the per sample charges outlined above, the total cost of this study is \$45,000.

### *Final Report*

For each hole we will provide logs of the down-hole variability in each of the 28 analyzed elements, as well as the petrographic data. This work will be compiled into a technical report to be made available to any and all interested parties.