**Transition to magma-driven rifting in the South Turkana Basin: Part 2**

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Description of Supplementary Information

S1: Images of volcanic and tectonic features of South Island. Images provided by Jeffery Karson. A) Pillow lavas and Hyaloclastites (Unit S1); B) North-South faults and fissures that have developed within tuff (Unit S3); C) Basalt lavas from Unit S4 overlying tuffs of Unit S3; D) Basalt lava from Unit S4; E) Basalt lava flows from Unit S4; F) Unconsolidated ash deposits (Unit S5) on western side of South Island; G) Line of cinder cones, looking north; H) Active solfatara.

S2: Images of melt inclusions from South Island. Samples are labelled MSU-01 through MSU-08 and correlate with volatile analysis and LA-ICPMS analysis of the melt inclusion. The host crystals are also shown; host crystal analyses are labelled based upon the same scheme.

S3: XRF data and standard information for whole rock samples from South Island.

S4: ICPMS data and standard information for whole rock samples from South Island.

S5: LA-ICPMS data for melt inclusions and host crystals.

S6: Output file from the MIMiC software suite that includes melt inclusion volatile data and the corrections applied. Abbreviations in the column headers are those described in Rasmussen et al. (2020).