

Figure F1. A. Map of the Naturaliste Plateau on the southwest Australian margin showing the location of IODP Expedition 369 Site U1513 and DSDP Site 258. Bathymetric contour interval = 500 m; Naturaliste Plateau is defined approximately by the 4000-m contour (modified from Borissova, 2002). B. Lithostratigraphy at Site U1513 (Huber et al., 2019b). C. Volcanic units of Holes U1513D and U1513E. The units are distinguished by changes in dominant lithology, texture, color, and physical properties and by the presence of faults, chilled margins and baked contacts.

Figure F2. Core images of representative volcanic units from Holes U1513D and U1513E. A. Unit 1 basalt flow with large visible plagioclase phenocrysts (369-U1513E-2R-6, 30–60 cm). B. Unit 2 tuff with altered plagioclase and basalt fragments at the base (369-U1513E-2R-8, 22–52 cm). C. Unit 3 plagioclase-phyric basalt flow with altered bluish white plagioclase megacrysts (plag); arrow = intrusive finger near the contact with dolerite dike (369-U1513D-66R-4, 110–140 cm). D. Unit 4 volcanoclastic flow showing irregular baked upper contact with flow of Unit 3 (369-U1513E-3R-1, 82–112 cm). E. Unit 5 basalt flow showing lobate structure with a curved, chilled margin and thin selvages (369-U1513E-3R-4, 3–33 cm). F. Unit 6 interflow breccia showing red baked contact with upper basalt flow (369-U1513D-68R-6, 86–116 cm). G. Unit 7 basalt flow with large phenocrysts of plagioclase (369-U1513E-5R-4, 63–93 cm). H. Unit 8 volcanoclastic flow with elongated basaltic clasts and mineral grains (369-U1513E-7R-4, 15–45 cm). I. Unit 9 basalt flow with plagioclase phenocrysts (369-U1513E-9R-5, 30–60 cm). J. Dike with xenolith (369-U1513E-8R-4, 20–50 cm).

Figure F3. Correlation plots of physical properties with volcanic units of Holes U1513E and U1513D. Bulk density is based on gamma ray attenuation (GRA) and moisture and density (MAD). cps = counts per second, IU = instrument units.

Figure F4. Representative thin section images from Holes U1513D and U1513E, showing petrographic details for selected lithologic units. A. Unit 1 plagioclase megacryst and olivine phenocryst with pyroxene rim (Sample 369-U1513E-2R-4, 0–2 cm, in plane polarized light [PPL] and crossed polarized light [XPL]). B. Unit 3 with large plagioclase phenocrysts showing clay alteration along cracks (Sample 369-U1513D-66R-4, 43–46 cm, XPL and PPL). C. Unit 4 showing poorly sorted basalt clasts and mineral grains (Sample 369-U1513D-67R-4, 62–65 cm, PPL). D. Unit 8 showing mineral grains and basaltic clasts in volcanoclastic beds (Sample 369-U1513D-75R-3, 52–54 cm, PPL). E. Fine-grained dolerite dike with intergranular texture between plagioclase and clinopyroxene (Sample 369-U1513D-74R-2, 20–22 cm, XPL). Ol = olivine, Plag = plagioclase, Cpx = clinopyroxene.

Figure F5. XRD mineralogical identification for Hole U1513E Unit 2 (Sample 2R-8, 20–22 cm), Unit 4 (3R-2, 30–32 cm), and Unit 8 (7R-3, 110–112 cm).