Biostratigraphic constraints on the Cretaceous Strand Fiord Formation flood basalts, central Sverdrup Basin, Canadian Arctic Islands

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The Strand Fiord flood basalt province is the largest of several Cretaceous-aged igneous episodes in the central part of the Sverdrup Basin, Canadian Arctic Islands. Though the unit has been recognized since the 1960s, the exact determination of its age has been hindered, initially, by a lack of age-diagnostic macrofossils, and, in subsequent work, an impoverished aquatic palynological flora indicative of brackish-water depositional environments. Despite these challenges, the published literature on age-diagnostic macrofossils from units above (Kanguk Formation) and below (Hassel and Christopher formations) the Strand Fiord Formation place constraints on its plausible

age. More recent palynological work in the same units, and the basal, "normal marine" part of the underlying Bastion Ridge, place tighter constraints on the age. There is no biostratigraphic evidence known that is consistent with a post-Cenomanian age, and nowhere does the Strand Fiord interfinger with the overlying, marine Kanguk Formation, the basal parts of which is partly Upper Cenomanian. The Strand Fiord Formation is only known to interfinger with sediments characteristic of the underlying Bastion Ridge Formation, or, at a few sites, it is locally overlain with thin terrestrial sediments consistent with the development of a subaerial unconformity at its top, prior to marine flooding by the Kanguk. Such a stratigraphic interpretation is also consistent with the lack of intrusives within the basal Kanguk, in stark contrast to the extensive intrusion of units below the Strand Fiord Formation.

At their widest extent, the biostratigraphic constraints from these units imply the Strand Fiord Formation could span the upper part of the Upper Albian to the lower part of the Cenomanian. There is no stratigraphic evidence for a post-Cenomanian or pre-Upper Albian age for the Strand Fiord Formation (i.e., its age must be >93.5 ± 0.8 Ma or <104.4 Ma according to current timescales). The likely age is probably a narrower zone within these limits, though whether the unit straddles the Albian/Cenomanian boundary (currently estimated at 99.6±0.9Ma), or is on one or the other side of it is still debatable.