

Subhorizontal Injection of Magma Forming the Popes Harbour Dyke

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At the time of injection, magma that formed the 15 m wide Popes Harbour dyke on the eastern shore of Nova Scotia carried with it pelitic xenoliths predominantly up to 1 m in length. Both the size and volume of xenolith material increase toward the center of the dyke, observations attributable to flowage differentiation processes. Xenocrysts of needle-like sillimanite are scattered throughout the dyke as a result of partial assimilation and disaggregation of the xenoliths. The sillimanite needles have resisted weathering and project from outcrop surfaces allowing accurate measurement of their orientations. On average they

strike northwest-southeast and plunge 20° to the southeast. Their orientation is parallel to the direction of magma movement indicating that the magma was injected in a subhorizontal direction toward the northwest. It is apparent that petrofabric analysis can be very useful in ascertaining the direction of magma flow in dykes. A preliminary literature review shows that subhorizontal movement of magma in mafic dykes (usually inferred using other approaches) is much more common than subvertical movement. It appears that dykes generally form through the lateral injection of magma.