

COMPUTER MODELING OF THE FORMATION OF KOMATIITE HOSTED NICKEL DEPOSITS

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Finite element computer simulations of komatiitic lava flow over ledges and hollows, which are taken to be embayments, show that back eddies develop behind the upstream ledge. These eddies serve to mix well sulphides with melt and would very effectively scavenge Ni from the lava. These back eddies are anticipated then to be zones of deposition of massive sulphides. The more vigorous the flow, the more vigorous the back eddy and the more efficacious the scavenging of Ni from the melt. The particulate matter gathered in the eddy tapers off down stream which conforms to field observation of some NI deposits. The middle portions of the eddy don't mix well and it is expected that they would be relatively barren zones. Flow over hollows reveals similar structure except that if the flow is fast enough, the eddy fills the whole hollow. If the flow is too fast, it essentially skips over the hollow and no eddies form in it. This implies that if the flow is too deep or too fast or both, there will be little deposition of massive sulphides in embayments. Although a thick flow would be conducive to a large R factor, if the slope down which it plunges is too steep, material might not collect in the embayments. On the other hand, the implication is that thin flows down steep slopes may still yield payable reserves.