

FACIES AND GLACIOTECTONICS OF UPPER ORDOVICIAN DEPOSITS, SW SAUDI ARABIA

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The Upper Ordovician (Ashgillian) glacial depositional record (the Sarah-Sanamah formations) is well preserved in both outcrop and subsurface of Saudi Arabia, and forms part of a much wider belt of Upper Ordovician glacial deposits of the northern and northeastern parts of the Gondwana Supercontinent. Their outcrop forms a discontinuous belt curved around the eastern perimeter of the Arabian Shield, dipping and disappearing into the subsurface towards the southeast, east and north. In a gross sense, the exposed Upper Ordovician glacial facies are of a proximal nature (coarse-grained, continental to shallow marine) to the west and southwest, becoming more distal (fine-grained, and deeper marine) in the subsurface to the east and northeast. In the SW outcrop belt (Wajid area) the glacial succession, here called the Sanamah Formation, comprises a complex facies association of subaerial and subaqueous current and gravity flow coarse clastics interpreted as periglacial outwash deposits. At numerous locations these deposits show severe deformation, including folding and faulting and fragmentation, whilst the adjacent older and younger units show no evidence of disturbance. In most of these same locations the glacial succession appears to fill incised valleys. The glacially filled valleys were incised into the exposed older Ordovician shelf sediments during a glacially induced eustatic sealevel fall. The deformations exhibited by the glacial sediments are interpreted as Push Moraines resulting from the lateral stress applied by the advancing glaciers over the recently deposited, unlithified but coherent, glacial outwash deposits. PS Company approval of content is pending.