

Characteristics of a Tapered Composite Halokinetic Sequence Within the Wonoka Formation Adjacent to the Ramping Patawarta Salt Sheet, Central Flinders Ranges, South Australia

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Preliminary field studies of the Neoproterozoic Wonoka Formation adjacent to Patawarta diapir, a ramping salt sheet, show that it forms a tapered composite halokinetic sequence (Tapered-CHS) bounded by angular unconformities. The basal boundary is at the contact with the underlying Bunyeroo Formation and the upper boundary is at the contact with the overlying Bonney Sandstone. The Wonoka Tapered-CHS thins by an order of magnitude toward the diapir, from 465m to 40.5m over a distance of approximately 1 km. It is composed of 7 mappable lithologic units that form an overall depositionally upward-shallowing succession from storm-influenced lower shoreface dolomite and siltstone to peritidal sandstone and carbonates. All 7 units thin towards the diapir, but vary in the magnitude of thinning (ranging from 67%-98%) and the extent of erosional truncation (4 units are truncated before reaching the diapir). The upper 4 units are aurally limited and form the onlapping fill of an incised valley developed adjacent to the diapir-related topographic relief. There is little diapir-derived detritus within the Wonoka Tapered-CHS and where present it is in granule to pebble lags associated with conventional depositional sequence boundaries or transgressive surfaces. No mass transport complexes were documented even though lithoclasts within the Patawarta diapir are enormous (ranging up to kms across). This suggests that topographic relief over the advancing salt sheet during Wonoka deposition was insufficient to produce failure of material into the surrounding sediments and that surface salt glacial flow during advance of the Patawarta sheet was unlikely.