

**Evaluating the relationship of Wirrealpa Diapir to the structure, stratigraphy, and reefal lithofacies of the adjacent lower Cambrian Wilkawillina and Mernmerna formations, Central Flinders Ranges, South Australia.**

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Our understanding of diapirism comes primarily from studying strata adjacent to diapirs. These strata are often deposited in distinct packages called halokinetic sequences. Two endmember types of halokinetic sequence exist: hook and wedge halokinetic sequences. Hook halokinetic sequences form when diapir rise rate exceeds sediment accumulation rate, while wedges form when diapir rise rate is less than sediment accumulation rate.

Wirrealpa diapir, located in the Central Flinders Ranges, South Australia, is adjacent to two minibasins containing significantly different thicknesses of the Lower Cambrian Hawker Group. The Donkey Bore Syncline southwest of the diapir has a reported Hawker Group thickness of 4,000 feet, while the Woodendinna Syncline to the north contains a reported 10,000 feet of Hawker Group sediments. It is hypothesized that these deposits are time correlative, and that the thickness difference is due to dissimilar sediment accumulation rates. Diapir rise rate must have been the same for each minibasin, removing this variable as a control on halokinetic sequence style. This allows exploration of how variations in sediment accumulation rate affect halokinetic sequence style. It is hypothesized that the Donkey Bore Syncline contains exclusively hook halokinetic sequences, while the Woodendinna Syncline contains only wedge halokinetic sequences. Knowledge gained in this study can be applied to other salt systems where we see basins with significant sediment influx adjacent to basins with little sediment influx.