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## Geometry and Kinematics of the Hormuz Salt in the United Arab Emirates: The Jebel Al Dhanna Salt Dome

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The UAE government is actively exploring the use of Hormuz salt domes for large-scale hydrogen and hydrocarbon storage, aligning with its strategic goals for clean energy transition and decarbonization. A comprehensive understanding of the geometry, kinematics, and halokinetic phases of these Infra-Cambrian Hormuz salt structures is crucial to achieving this vision. This study focuses on the Jebel Al Dhanna salt dome, the only exposed salt dome in onshore Abu Dhabi. Utilizing three 3D seismic surveys and data from four boreholes, the research analyzes its morphology and evolution. The Jebel Al Dhanna salt dome exhibits an elliptical structure elongated in the N-S direction, with dimensions ranging from 2 to 2.8 km (E-W) and 3.2 to 4.2 km (N-S). The dome features irregular crests, steeply dipping flanks, and a series of hills rising approximately 110 m above sea level. Surrounding the dome is a pronounced rim syncline, resulting from the upward evacuation of Hormuz salt through the thick Phanerozoic stratigraphic succession, creating a discordant relationship with the dome structure. Salt withdrawal at Jebel Al Dhanna likely initiated in the Late Cretaceous, driven by the reactivation of inherited basement faults associated with ophiolite obduction onto the Arabian foreland. Halokinetic activity persisted through the Oligocene-Miocene, coinciding with the continent-continent collision of Central Iran and the Arabian Plate. The presence of tilted Upper Miocene and Quaternary strata around and within the Jebel Al Dhanna salt dome underscores continued salt evacuation to the present day. This research highlights the importance of salt tectonics for energy resource storage and provides valuable insights into fault-salt interactions, with significant implications for hydrocarbon exploration, energy security, and the UAE's decarbonization initiatives.