

## **Deep sandstone reservoir quality prediction model: An case study of Fu III Interval in Zhangjiaduo Oilfield, North Jiangsu Basin**

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Deep sandstone reservoir quality is key factor for the exploration of Zhangjiaduo oilfield, North Jiangsu Basin. Based on the observation of casting thin sections, scanning electron microscopy(SEM), X-ray diffraction, and burial history analysis, abnormal high pressure caused by undercompaction inhibited the compaction of reservoirs which resulting weak compaction and developed a large number of intergranular pores; however, Fu 3 interval has deeply burial depth. Moreover, in the fine-grain sandstone reservoirs, the quartz overgrowth and the cementation of ferrous calcite have been restricted by the high matrix content and the premature closure of the diagenetic system; therefore the fine-grain reservoirs are mainly affected by clay cementation and the compaction is the major control factor of reservoir properties. Since undercompaction is more significant at deep syncline, the undercompaction-caused abnormal pressure can offset part of the overlying strata pressure caused by the increasing burial depth; therefore, high-quality reservoirs can be found at deep syncline. Abnormally high pressure, sedimentary facies, and diagenesis indicate that bar sandstones in deep-syncline under high pressure have developed high-quality reservoirs which confirmed by recent drilling wells. Moreover high-yield oil production was obtained, which indicates the breakthrough in deep syncline oil-gas exploration.