

A system of large to small northwesterly flowing braided streams, fed from the quartz-rich southern source, deposited clean, laterally persistent, reservoir sands (braided fluvial and delta front facies) and impervious sealing shales (prodelta slope and prodelta shelf facies) across the slowly subsiding Saharan Platform. These deposits can be traced northward in the subsurface, across the entirety of western Libya, into the outcrop in the Jebel Nefusa, the northern limit of onshore control. Deposition ultimately extended northward into the more rapidly subsiding, organic rich, Gabes-Sabratha basin.

Simultaneously, the locally sourced reservoir facies were deposited, north-northwesterly, from the region of the Garian basement high. Coarse conglomerate quartz sands (braided fan delta plain facies) were transported a short distance to the Jebel Nefusa and northward, forming a wedge of clean, reservoir quality sands (braided fluvial and delta front facies) and sealing shales (prodelta slope and prodelta shelf facies) lying below well control in the Gabes-Sabratha basin area immediately adjacent to the Libyan coast due west of Tripoli.

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Lithofacies and Paleontology of Late Paleozoic Allochthonous Deep-Water Carbonates: Example from West Texas Subsurface

Twenty-one lithologies have been identified in cores of lowermost Wolfcampian limestone and shale in six wells in Reagan and Crockett Counties in the general area of World field, Midland basin. These lithologies are summarized into four major lithofacies: (1) floatstone and variably compacted rudstone containing angular, lithologically diverse, platform-derived lithoclasts and bioclasts in a clayey or marly matrix; lithoclasts are a product of disintegration of lithified platform facies, probably Wolfcampian; (2) interbedded shale and thin, horizontal, and in places ripple-laminated, carbonate sands mainly of allochthonous bioclasts; (3) micritic rudstone and wackestone containing platform-derived micritic intraclasts and bioclasts; this facies is variably porous with intergranular, moldic, solution-enlarged moldic, intragranular, and fracture porosity; (4) argillaceous packstone and wackestone with allochthonous bioclasts and intraclasts and semi-intraclasts of off-platform origin; this facies displays a variety of soft sediment deformation features.

Facies components probably were supplied and emplaced episodically by a variety of shelf edge and slope processes during a time of faulting in the area. Syndepositional faulting is interpreted from thickening of strata on downthrown sides of faults. Rudite-size clasts were transported 15 mi (24 km) or more from the Central Basin platform to the west. Finer detritus swept basinward for much greater distances. Limited comparison is made with carbonate sediments of Exuma Sound, Bahamas.

Off-platform Wolfcamp facies abruptly overlie and contrast strongly with a variety of Des Moines (Strawn) shallow subtidal platform facies displayed in three cores. The contact, present in one core, is interpreted primarily as a nondepositional disconformity.

Age and facies determinations from the cores significantly alter correlations and interpretations made with wireline logs alone, resulting in improved exploration play concepts. Allochthonous carbonate complexes may well provide new, potentially important reservoirs in this region.

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Holocene Gypsum Types and Formative Processes in Tidal Flat Settings, Carnarvon Basin, Western Australia

Study of gypsum presently forming in terrigenous and carbonate tidal flats along the semiarid coastline of Western Australia indicates that gypsum crystal habits, textures, structures, and fabrics developed on or within host sediments can be correlated with the physical, chemical, and hydrologic conditions of formation. By treating the study of gypsum from a sedimentologic approach, a classification of gypsum types is developed which allows comparative analysis and appears to be applicable to the interpretation of ancient evaporitic sequences.

Gypsum precipitated on a substrate from a free-standing body of water crystallizes in a habit dominated by the prism (110) and displays variations in texture, fabric, and structure that are related to the maintenance or progressive change in environmental conditions within the brine body. The action of physical and organic agencies is important in the genesis of the fabrics and structures displayed and in their destruction to form clastic gypseous sediments.

Gypsum precipitated within a host sediment crystallizes in a habit dominated by the hemi pyramid (111) and displays textures, fabrics, and structures that are related to host sediment properties, brine chemistry, ground-water hydrology, and the mechanisms for maintenance of such environmental conditions. Gypsum emplacement acts to disrupt and modify sedimentary features within the host and to form new textures, fabrics, and structures which are related to, and overprint, their precursors.

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Sunnyside Petroleum-Impregnated Sandstone Deposit, Uinta Basin, Utah

The Sunnyside oil-impregnated sandstone deposit is a giant, exhumed oil field which occurs in the Green River Formation (Eocene), southwestern Uinta basin, Utah. The updip limit of the deposit has been eroded; thus, the precise mechanism of entrapment cannot be determined.

The deposit occurs within a transgressive continental and lacustrine sequence. The alluvial Colton Formation (early Eocene) underlies the deposit and grades into marginal lacustrine strata of the overlying Green River Formation. The lower part of the marginal lacustrine sequence is predominantly deltaic, but the upper third is interbedded with open lacustrine facies. The uppermost part of the Green River Formation in the area is eroded.

Petroleum-impregnated sandstone beds occur throughout the approximately 1,370 ft (418 m) of exposed marginal lacustrine facies. However, the main part of the deposit has a gross oil column of at least 860 ft (270 m) of which 640 ft (195 m) are petroleum-saturated siliciclastic rocks.

The deposit is exposed only on the southwest side and at the northwest corner. Only 12 significant wells were drilled in an area of 20 sq mi (52 sq km) prior to 1979. Thus, the limits of the deposit and the contained petroleum resource are difficult to assess. The delineated part of the deposit contains about 2.2 billion bbl of petroleum in place. The downdip limit of the deposit has not been defined.

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