Digital Oil-Play Maps of the Permian Basin*

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Abstract

The Permian Basin of west Texas and southeast New Mexico, which produced >30 Bbbl of oil through 2000, remains an important oil-producing province. Because of the substantial amount of oil remaining in the basin, a digital oil-play portfolio was developed. A total of 1,339 significant-sized reservoirs in the basin each had cumulative production of >1 MMbbl of oil through 2000; total production from these reservoirs was 28.9 Bbbl. Thirty-two oil plays covering both the Texas and New Mexico parts of the Permian Basin were defined on the basis of reservoir stratigraphy, lithology, depositional environment, and structural and tectonic setting. Each significant-sized reservoir was assigned to a play and mapped using the Geographic Information System (GIS).

GIS files illustrate reservoirs, play boundaries, and boundaries of major geologic elements. For Texas reservoirs, wells were buffered by 0.5 mi and reservoir boundaries manually simplified. Although reservoir outlines generated by this process show approximate location, size, and shape of each reservoir, they are not precise boundaries. A reservoir shapefile for each play contains the geographic location of each reservoir and attribute information, including play name, play code, RRC unique reservoir number, RRC district, field name, reservoir name, state, county, discovery year, depth in feet to top of the reservoir, 2000 production in barrels, and cumulative production in barrels through 2000. New Mexico oil-pool-boundary (reservoir) and play-boundary GIS shapefiles were provided, rectilinear boundaries of New Mexico reservoirs reflecting legal definition of the fields. New Mexico and Texas play-boundary data were merged to form a single Permian Basin play-boundary shapefile. A map of five Pennsylvanian plays producing from ramp and platform carbonates and slope and basin sandstones illustrates the play maps.
The oil play maps of the Permian Basin were developed as part of the U.S. Department of Energy's \( \text{DOE} \) Geology Program, and the \( \text{DOE} \) \text{DOE} \text{DOE} Geologic Framework Project under the \text{DOE} \text{DOE} Geologic Framework Project. The maps provide a spatial overview of the distribution of oil reservoirs in the Permian Basin, which covers parts of Texas, New Mexico, and Utah. The maps include data on geological features, reservoir types, and oil production over time. The maps were created using Geographic Information System (GIS) technology, with data sources including well logs, seismic data, and geological maps. The maps can be used to identify potential exploration areas and to better understand the geology of the basin.

The maps are divided into two main sections: Pennsylvania and Permian. The Pennsylvania section includes maps of the Pennsylvania Plays, which are further divided into the Upper Pennsylvania and Lower Permian Plays. The Permian section includes maps of the Upper and Lower Permian Plays, as well as maps of the Basin Sandstone Play. Each map provides a visual representation of the oil reservoirs within the respective play, with colors and symbols indicating different types of reservoirs and their locations. The maps also include information on the geological features that influence oil reservoirs, such as fault lines and fold belts.

The maps are interactive, allowing users to zoom in and out to view different levels of detail. Users can also access additional information such as well data and production statistics by clicking on specific areas of the map. The maps are intended to be used by geologists, engineers, and policymakers to make informed decisions about oil exploration and production in the Permian Basin.