

Iniskin Peninsula Conventional and Unconventional Exploration Targets, Jurassic Tuxedni Group, Lower Cook Inlet Onshore, Alaska

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ABSTRACT

Since the turn of the century, the Iniskin Peninsula has been the object of several vintages of exploration—from the half a dozen cable-tool oil gushers drilled adjacent to surface oil seeps in the early 1900's, to deeper 8,775 to 11,231' depth wells drilled in the 'high camp' area during the 1930's and 1950's, to the first 2D seismic survey conducted on the peninsula during 2013. Trap at Iniskin prospect consists of a southwest-plunging, 55,000-acre, breached anticline, defined by surface geology, topography, oil seeps, oil shows in seismic shotholes, vintage magnetics, and 2D seismic. Early explorations concentrated on mapping out the surface geologic structure and the locations of oil and gas seeps. The first drilling campaign during the early 1900's concentrated on drilling the oil seeps in the Oil Bay area, and wells flowed oil and gas from 120', 190', 500', and 770' depths. During the early 1930's, and again in the 1950's, exploratory drilling concentrated to the northeast, up-plunge, in 'high camp' area. These later wells all flowed oil and gas at noncommercial rates. Prospective oil and gas reservoirs consist of two radioactive organic mudrocks in the Middle Red Glacier Formation measuring 1292' and 300' thick, located within the oil generative window. In addition to these two unconventional targets, the uppermost Talkeetna volcanic breccia, plus sandstone beds within the Lower Red Glacier Formation, both display secondary dissolution porosity development and are highly prospective conventional targets. The 2D seismic acquired by Hilcorp during 2013 indicates that all of the wells drilled to date have missed the crest of the deeper structure, and that the anticlinal axis at the surface is offset to the west relative to the deeper anticlinal crest. In addition to conventional reservoir targets, numerous low-porosity, low-permeability oil saturated sandstones exist, which might be commercialized given modern lateral and / or hydraulic fracturing technologies. The remaining risk parameters at Iniskin—source rocks and timing & migration—are mitigated inasmuch as: 1) oil seeps located at N 59 degrees 40.603 minutes latitude, W 153 degrees 19.447 minutes longitude, elevation 65.7', consist of 16 API green-brown, sweet oil, typed to Jurassic Tuxedni source rocks, and 2) live oil was observed in 8 seismic shotholes drilled along the crest of the surface anticline. Additional explorations are planned in the vicinity in the near future.