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OIL SANDS OF SÃO PAULO STATE, BRAZIL AND LA BREA DE CHUMPI, PERU; A GEOLOGIC PERSPECTIVE

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ABSTRACT

Oil sands in São Paulo State, Brazil, are found in outcrops of the Triassic/Jurassic Piramboia Formation. These significant oil sands localities occur on the northern flank of the Ponta Grossa Arch of the Parana Basin of southern Brazil. All the occurrences are found in cross-bedded sandstones of continental origin. Because of the nature of the lithofacies lateral variations in oil saturation are common. Saturations average 7-8 wt.% and range up to 13 wt.%. Most oil sands occurrences are associated with faults or diabase dykes, or the flanks of highs in the vicinity of faults or dykes. The oil was probably sourced in the bituminous shales of the Permian Irati Formation and migrated upward during Lower Cretaceous time along faults and dyke margins.

In the Chumpi area, located in the western belt of the Andes Mountains of southern Peru, oil sands occur in volcanic rocks of the Oligocene Para Formation at approximately 3800 m elevation. The oil sands are found in tuffs at several stratigraphic levels in scattered outcrops and 1930s mineworkings. They occur along the crest of an elongated dome, which at one end has been breached by a major fault. At one locality oil is found in the vesicles and fractures of a lava flow. Oil saturations average approximately 4-5 wt.% and a maximum of 11 wt.% was recorded. The source for the oil is believed to be from underlying marine limestones of late Jurassic to early Cretaceous age.

Study of these two "non-conventional" oil sands occurrences has pointed out the fact that oil sands are found in widely varying geological situations and that not all oil sands have origins similar to the supergiant "conventional" deposits of Canada and Venezuela.

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