



AUTHOR David A. Vralsted
AFFILIATION Standard Oil Production Company
ADDRESS 5151 San Felipe, P. O. Box 4587, Houston, TX
77210
TELEPHONE (713) 552-8595

TITLE: Delineation of shallow subsea permafrost and gas-charged
sediments

ABSTRACT

A 3.5 kHz subbottom reflection survey combined with seismic refraction velocities were used to define the areal distribution of shallow ice-bonded and gas-charged sediments in Harrison Bay, Alaska. For verification, the results of these geophysical investigations were cross referenced with shallow geotechnical borehole information. The subsea permafrost zones (mainly ice-bonded sands) appear as strong, continuous, flat reflectors and have seismic refraction velocities ranging between 1800 m/s and 2200 m/s. Free gas within the shallow subsea permafrost zones appears to account for the anomalously low ice-bonded sand velocities (< 2000 m/s). The combined results indicate that three laterally continuous, shallow subsea permafrost zones exist in Harrison Bay.

The distribution of shallow, ice-bonded and gas-charged sediment is of economic and engineering importance. This type of geophysical investigation, tied to geotechnical well information, can identify these potential geological hazards which may exist near proposed offshore drilling pads, pipelines, causeways and other offshore installations.

