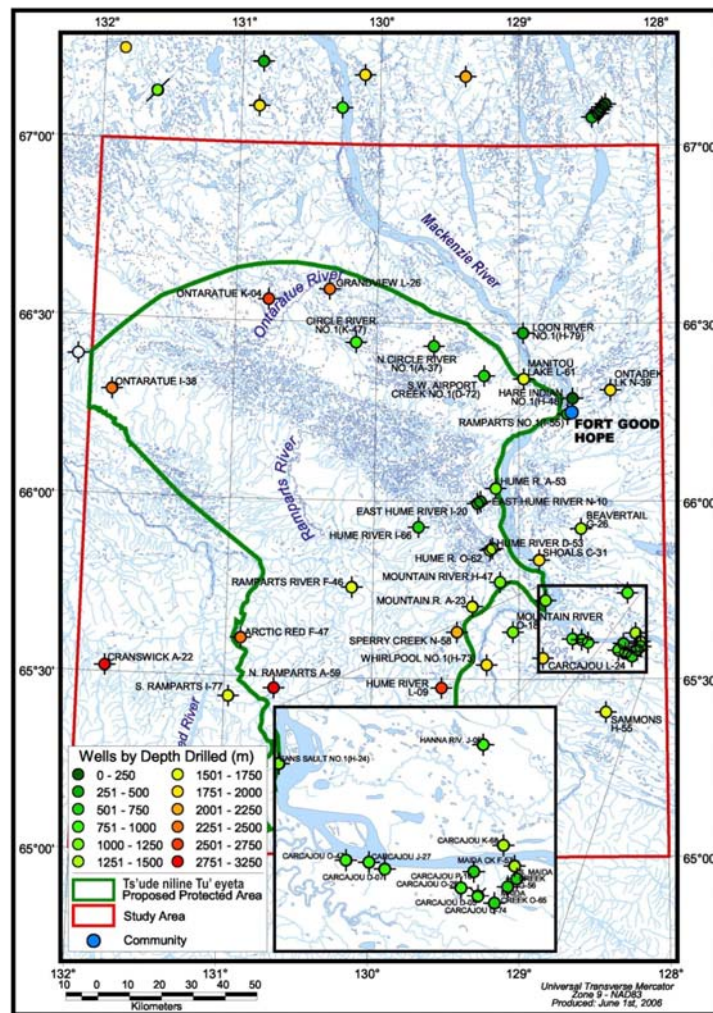


Hydrocarbon Potential of Ts'ude niline Tu'eyeta (Ramparts River and Wetlands) Candidate Protected Area¹

Introduction

This report summarizes an assessment of the hydrocarbon (oil and gas) resource potential of the proposed Ts'ude niline Tu'eyeta Candidate Protected Area. The study area covers about 15,000 square kilometres, or 1.5 million hectares, and stretches from the Mackenzie River to the border of the Gwich'in Settlement Area. The settlement of Fort Good Hope lies on the eastern boundary of Ts'ude niline Tu'eyeta. Most of Ts'ude niline Tu'eyeta is in the Interior Platform geological province, an area of generally flat lying sedimentary rock consisting of sandstones, shales, limestones, and dolostones. These rocks were deposited over a period of almost 400 million years extending from the Cambrian geological period to the Cretaceous.



Exploration wells in the study area. Most wells are relatively shallow, with deeper wells restricted to the southern and western parts of the study area (from Gal 2007).

¹ Present summary report modified after: Gal, L.P. 2007. Ts'ude niline Tu'eyeta (Ramparts River and Wetlands) Candidate Protected Area, Phase I Non-renewable Resource Assessment – Petroleum. Northwest Territories Geoscience Office, NWT Open File 2007-01.

How did we determine potential?

The assessment is based on our best understanding of the geology of the area including the surface rocks, those below the surface, and features found within the rocks. We relied on pre-existing geological maps and studies of the area, work done by the Canadian Gas Potential Committee on the hydrocarbon 'plays', and information from exploration wells. Twenty-one oil exploration wells were drilled between 1945 and 1991 within the proposed boundaries of Ts'ude niline Tu'eyeta. Most of these were drilled in the 1960s and 70s, and in the southeast quadrant of the study area. One well found gas but is not producing. The others were dry and abandoned. An economic assessment is beyond the scope of a geological analysis so is not included in this report.

Summary of Potential

The mapped boundaries between rock types and play definitions are mostly based on work previously published by other workers. Seven conceptual hydrocarbon plays have been delineated within the study area. Plays generally correspond here to stratigraphic packages and those judged to have the greatest exploration potential are: Kee Scarp (Middle Devonian reef), basal Cretaceous siliciclastics, Arnica/Landry platform (Lower Devonian carbonate), and Upper Devonian siliciclastics. They are known to have significant hydrocarbon occurrences which increase the likelihood of their being associated with a petroleum system containing rich source rocks, reservoirs, and/or good traps and preservation. The Cambro-Ordovician platform play probably has less potential, partly because of a lack of source rocks. The Basal Cambrian clastic play is poorly understood due to a lack of information, and a supposedly restricted reservoir distribution. Devono-Mississippian siliciclastics are poorly distributed within the study area.

Consideration of all the plays together gives the Ts'ude niline Tu'eyeta Candidate Protected Area north of the Mackenzie Mountains a moderate potential for oil and gas; the Mackenzie Mountains in the south part of the study area has a low potential due to reservoir breaching, or flushing and/or degradation of hydrocarbons by surface or ground water.

Future work

A new set of quantitative hydrocarbon play assessments for the Northwest Territories is being prepared by the Geological Survey of Canada for release in 2008-2009.