

Yukon Oil and Gas Overview 2014

*Donald C. Murphy*¹
Yukon Geological Survey

Murphy, D.C., 2015. Yukon Oil and Gas Review 2014. *In: Yukon Exploration and Geology Overview 2014*, K.E. MacFarlane and M.G. Nordling (eds.), Yukon Geological Survey, p. 67-72.

INTRODUCTION

Yukon has eight onshore oil and gas exploration regions with a combined total of assessed conventional hydrocarbon resources of 14.77 Tcf (trillion cubic feet) of natural gas and 662.6 MMbbls (million barrels) of oil (mean conventional in-place petroleum potential; Fig. 1). In addition, Yukon has an interest in offshore hydrocarbon exploration and development in the Beaufort Sea with its estimated discovered conventional petroleum resources of 9.20 Tcf of natural gas and 4917.9 MMbbls of oil (Fig. 1; National Energy Board, 2014). Yukon and the Beaufort Sea are frontier exploration regions with only a small number of companies exploring them. Expenditures totalling over \$20M were spent on oil-and-gas-related activities in onshore Yukon in 2014.

This paper presents the highlights of oil and gas-related activity in Yukon in 2014 and describes issues that are affecting Yukon oil and gas activity.

2014 HIGHLIGHTS

Exploration and/or development activities are proposed or currently underway in two of Yukon's exploration regions, Eagle Plain and Liard basins, the latter containing Yukon's only natural gas field with historic production (Fig. 1). Furthermore, oil and gas rights were issued for a parcel in the Beaufort offshore by Aboriginal Affairs and Northern Development Canada and regulatory discussions between the National Energy Board and two proponents of offshore drilling are underway.

EAGLE PLAINS EXPLORATION REGION

Northern Cross (Yukon) Ltd. (NCY), with partner CNOOC (Chinese National Offshore Oil Corporation Ltd.), is in its 7th year of exploring its 5261 km² permit area in the Eagle Plain region of northern Yukon (Figs. 1 and 2). NCY advanced its exploration effort in the past year by following up their 2012-13 four-hole drilling program (Fig. 2) with 3D seismic and airborne LiDAR, methane and temperature surveys (Fig. 3; Northern Cross (Yukon) Ltd., 2014a,b). Approximately 325 km² were covered by the 3D seismic survey, overlapping most 2012-13 well locations.

The results from the 2012-13 drilling and 3D seismic survey have been promising enough that NCY has proposed a 20-hole drilling program within the area of the seismic survey, proposed to start in early 2015 (Fig. 3; Northern Cross (Yukon) Ltd., 2014b). The focus of the program will be the discovery and appraisal of conventional crude oil and natural gas resources. With discoveries and positive drill stem tests, wells are proposed to undergo extended flow testing in order to evaluate the long-term viability of the resource. This proposal is currently undergoing public review in the Yukon Environmental and Socio-economic Assessment Board (YESAB) process, with Board recommendations anticipated in early 2015.

¹don.murphy@gov.yk.ca

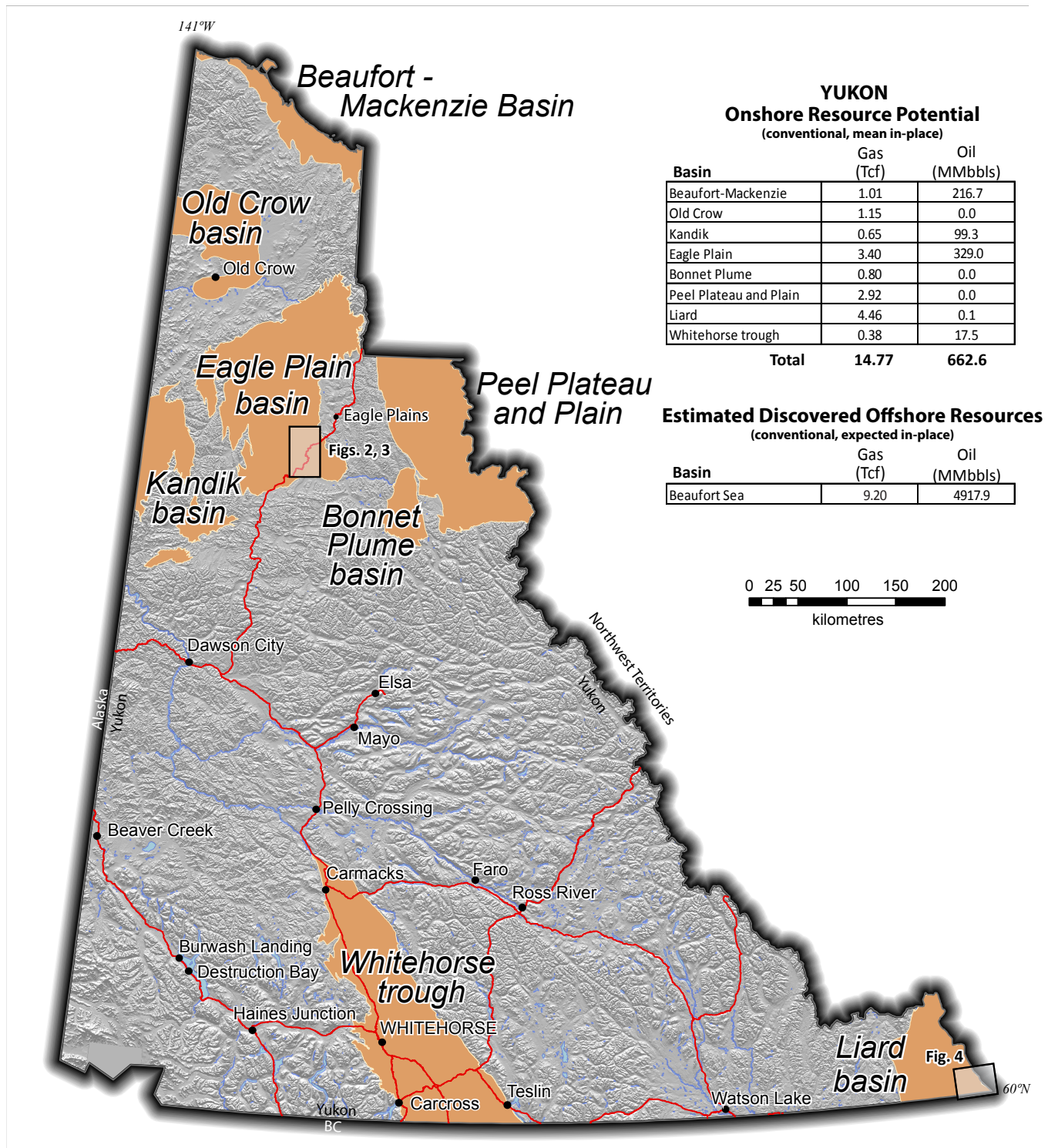


Figure 1. Yukon’s onshore oil and gas exploration regions and their assessed conventional resource potential (modified from Yukon Government Oil and Gas Resources Branch, 2014). The resource tables also include the estimated discovered conventional petroleum resources of the Beaufort Sea in which Yukon has an interest (National Energy Board, 2014). The locations of Figures 2-4 are indicated by boxes.

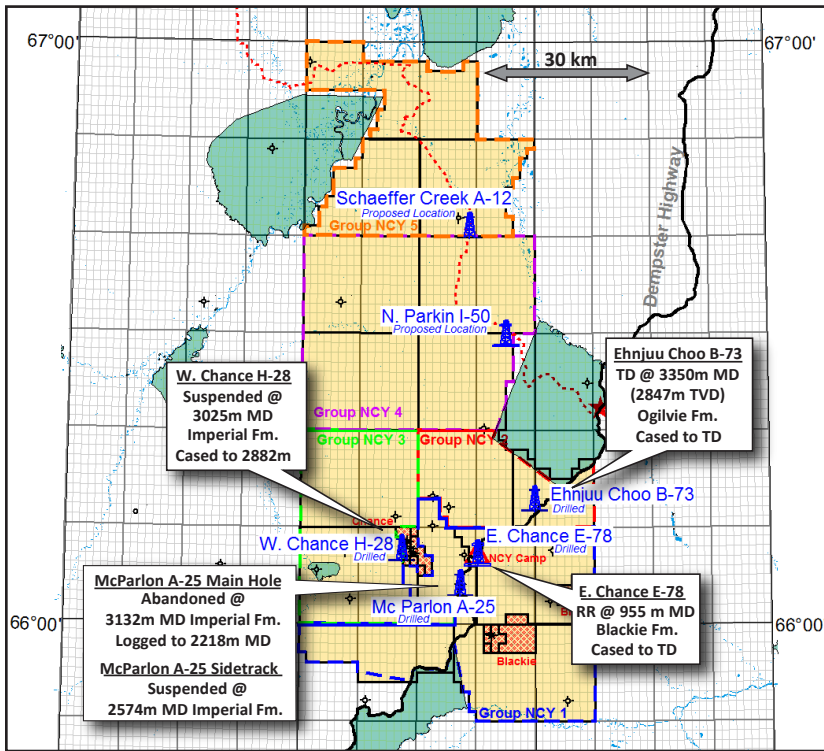


Figure 2. Location of Northern Cross (Yukon) Ltd.'s exploration licenses and drill holes. The location of Figure 2 in Yukon is indicated in Figure 1 (modified from Northern Cross (Yukon) Ltd., 2014a).

NCY has spent more than \$105M in exploring their permit area since 2011, a significant portion of it on employment and services in Yukon (Northern Cross (Yukon) Ltd., 2014b,c,d). Expenditures associated with the 2012-13 drilling program exceeded \$80M with \$16M spent in Yukon. Yukon expenditures supported 88 Yukon-based suppliers of goods and services and a work-force averaging 20% Yukon residents, including many First Nation citizens (Northern Cross (Yukon) Ltd., 2014c). Camp construction and maintenance expenditures totalled over \$5M. The 2013-14 3D seismic and other programs cost over \$20M, with \$4.4M (>22%) spent directly in the Yukon supporting 51 businesses and Yukon residents (Northern Cross (Yukon) Ltd., 2014c,d). The seismic program alone entailed 7890 person-days of employment of which 2249 went to Yukon residents (average 29%; Northern Cross (Yukon) Ltd., 2014d). Thirty-six Yukon First Nation citizens were either employed or in industrial training programs which included tree-falling/chainsaw, WHMIS, H₂S, first aid (including AED) and drilling (Don Stachiw (NCY), *pers. comm.*).

LIARD EXPLORATION REGION

EFLO Energy Inc. (EFLO) acquired the rights to the past-producing Kotaneelee gas field of southeastern Yukon in 2012 (Fig. 4). Past production from the Kotaneelee field was the basis for over \$46M in royalties to the Yukon government between 1993 and 2012. EFLO's strategy is to re-establish conventional natural gas production from proven reservoirs in hydrothermal dolomite of the Lower to Middle Devonian Nahanni Formation (Manetoe facies), and tested reservoirs in carbonate rocks of the older Arnica and younger Flett formations, while exploring the unconventional shale gas potential in the Upper Devonian-Lower Carboniferous Besa River Formation (Adilman, 2014). EFLO recently submitted a proposal to YESAB to complete workovers on two existing wells (B-38 and I-48) in order to rejuvenate conventional natural gas production (Fig. 4). A decision is anticipated in early 2015.

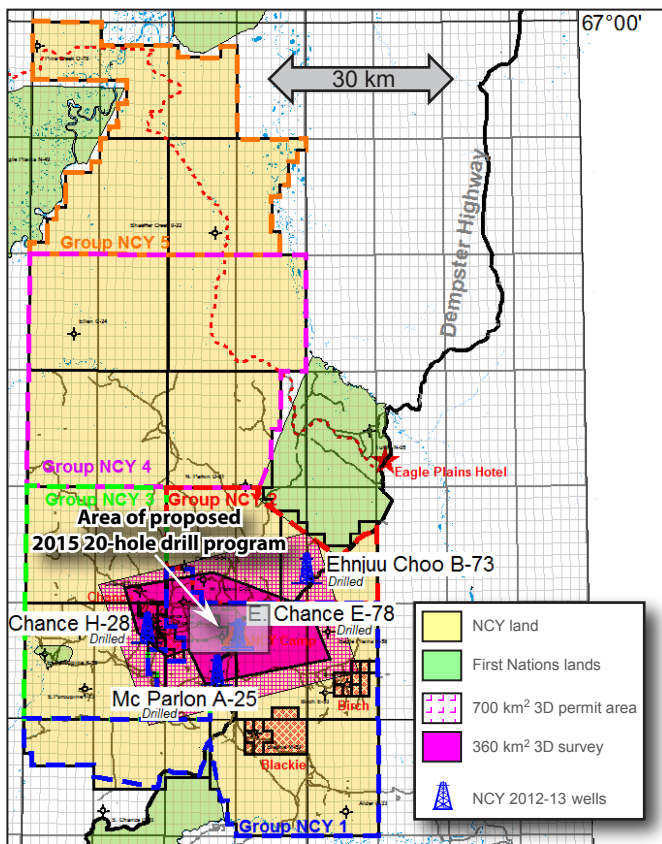


Figure 3. Areas of Northern Cross (Yukon) Ltd.'s 2014 3D seismic program and proposed 20-hole drilling program (modified from Northern Cross (Yukon) Ltd., 2014b).

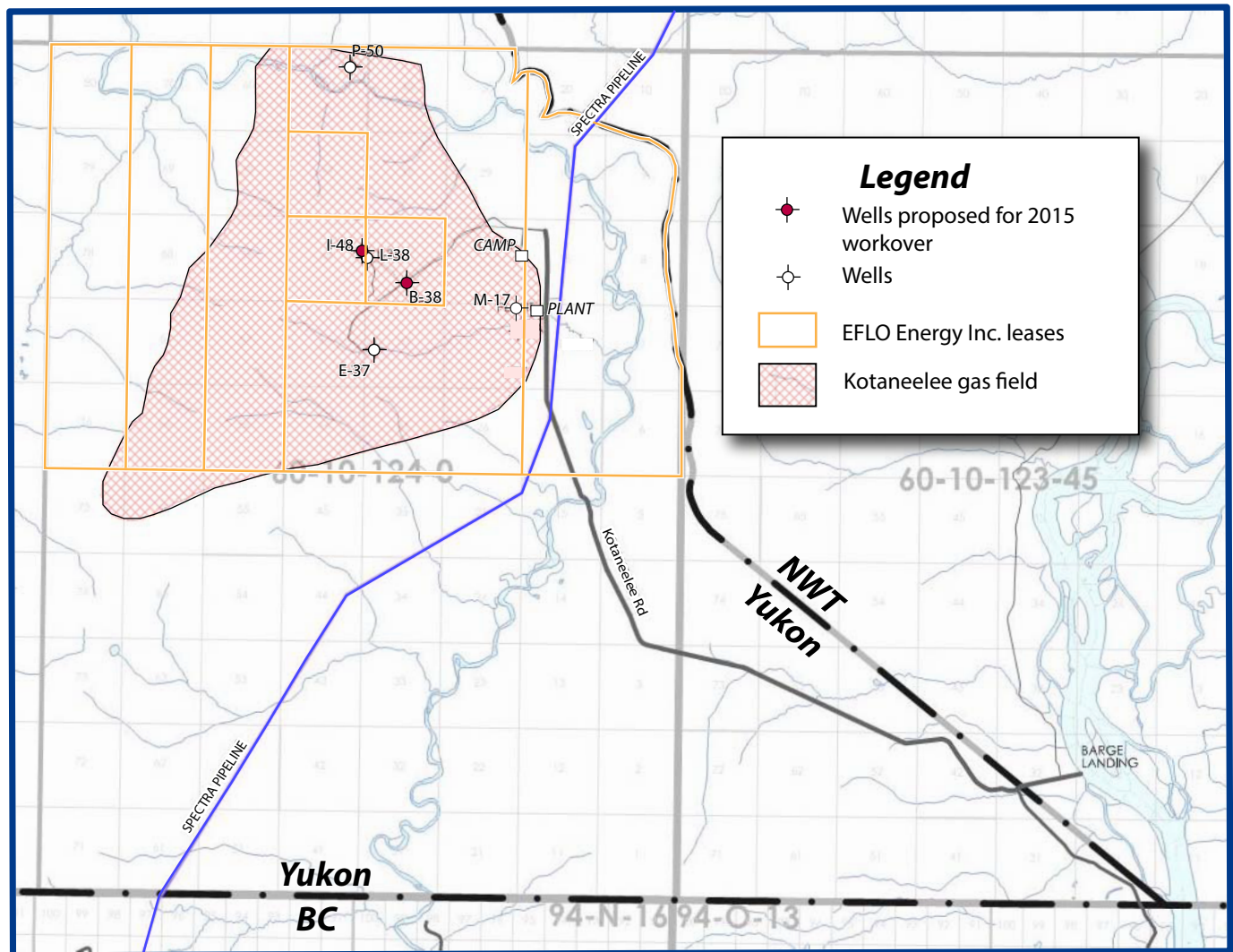


Figure 4. Map of Kotaneelee gas field in southeastern Yukon showing EFLO’s leases and associated oil and gas exploration and development infrastructure. See Figure 1 for location in Yukon. Map modified from EFLO’s presentation at Yukon Geoscience Forum, Whitehorse, November, 2013.

BEAUFORT SEA

The status of Yukon’s interest in the Beaufort Sea has not changed since last reported in Adilman (2014). Oil and gas exploration and development activity in the Beaufort Sea in 2014 comprised discussions between the National Energy Board and two project proponents (Imperial Joint Venture and Chevron) seeking a ruling on the requirement for a same-season relief well, and a successful Call for Bids for Exploration Licenses by Aboriginal Affairs and Northern Development Canada in which Franklin Petroleum Canada Ltd. was the successful bidder. Figure 5 shows

the locations of the new disposition and the Exploration Licenses over which same-season relief well requirements are being held.

FACTORS INFLUENCING YUKON’S INVESTMENT CLIMATE

A number of recent and impending legal or political developments related to Yukon’s resource sector may influence private-sector investment decisions in Yukon’s oil and gas sector. These developments include a recent legal

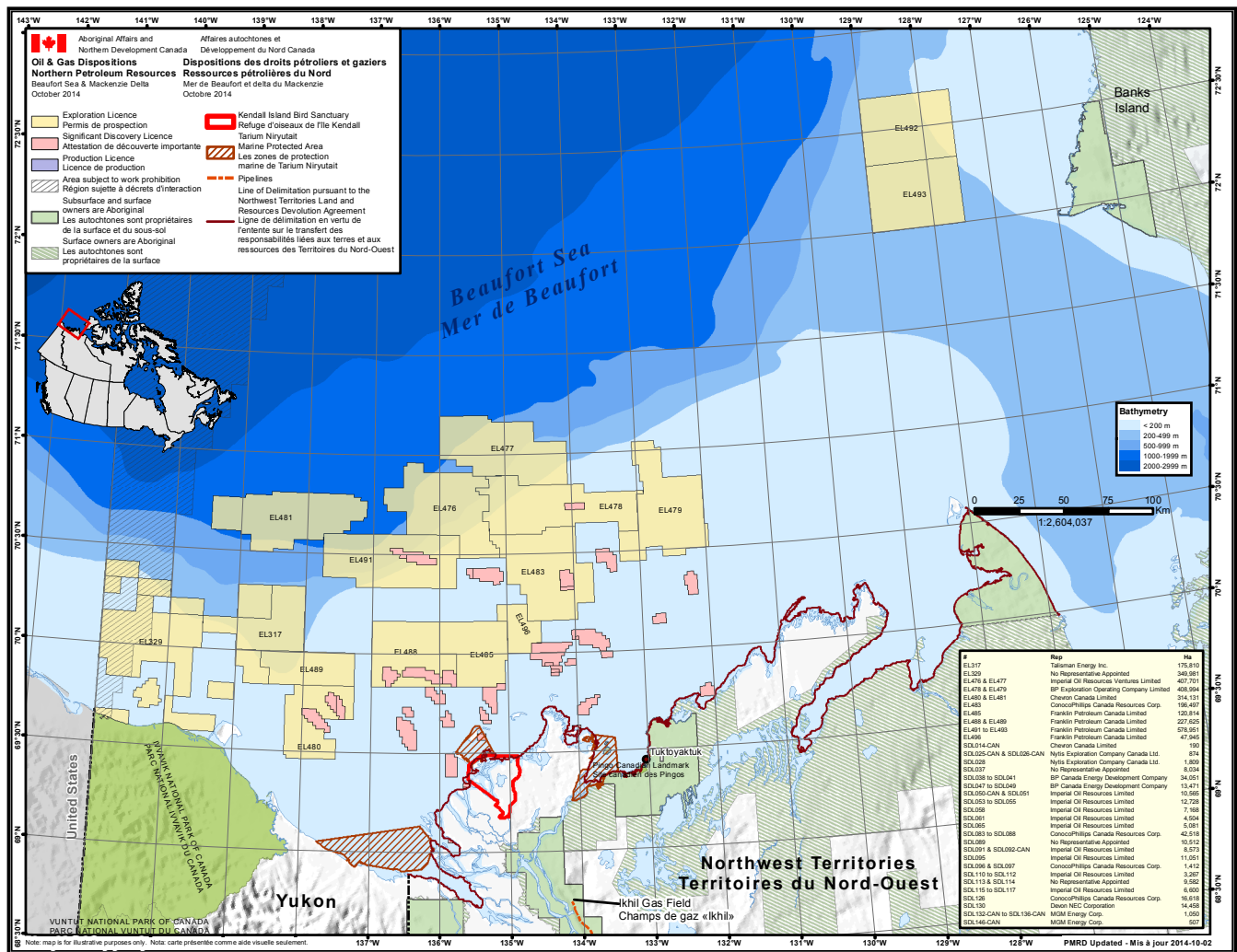


Figure 5. Location of exploration parcels in the Beaufort Sea. Franklin Petroleum Canada Ltd.'s parcel acquired in the 2014 land disposition is EL 496. Map source: http://www.aadnc-aandc.gc.ca/DAM/DAM-INTER-HQ-NOG/STAGING/texte-text/le_mp_bsm_d_pg_1371579383933_eng.pdf, accessed December 2014.

decision regarding land use plans for the Peel watershed planning region which includes areas prospective for oil and gas, and an impending report from the Yukon Legislative Assembly's Select Committee on the Risks and Benefits of Hydraulic Fracturing. In addition, moratoria on the issuance of oil and gas rights in the Whitehorse trough and Liard basin are still in place.

For up-to-date information on the status of land within Yukon's exploration regions, please refer to the Yukon Land Status map at: http://www.emr.gov.yk.ca/oilandgas/pdf/Yukon_Land_Status_and_Oil_and_Gas_Interests.pdf.

ONSHORE YUKON DISPOSITIONS

Yukon held two Requests for Postings in 2014 as per the Yukon Oil and Gas Act. The fall 2014 Request for Postings closed on July 9, 2014. The disposition process concluded without any expressions of interest from the oil and gas industry. The spring 2015 Request for Postings closes January 7, 2015.

SUMMARY

The potential of the oil and gas industry to contribute significantly to Yukon's economy was again demonstrated between 2012 and 2014 when Northern Cross Ltd. spent over \$105M in exploration on their Eagle Plains parcel, a significant portion of which went to Yukon businesses and employees. Future activities in Yukon and the associated investments by NCY and EFLO Energy Ltd. are currently under review by YESAB. Exploration in all Yukon exploration regions is currently challenged by a number of legal and political issues facing Yukon government. Over the short to medium term, as decisions with respect to land access and multi-stage hydraulic fracturing (MSHF) are made, the future role of oil and gas exploration and development as contributors to the Yukon economy will be clarified.

ACKNOWLEDGEMENTS

Early drafts of this overview were greatly improved by input from Carolyn Relf, Tiffani Fraser, Ron Sumanik and Jesse Devost.

REFERENCES

- Adilman, B., 2014. Yukon Oil and Gas Overview 2013. *In: Yukon Exploration and Geology Overview 2013*, K.E. MacFarlane and M.G. Nordling (eds.), Yukon Geological Survey, p. 59-66.
- Northern Cross (Yukon) Ltd., 2014a. Eagle Plain 3D seismic & exploration project review presentation. http://www.northerncrossyukon.ca/upload/news_item/9/01/3d-seismic-exploration-project-review.pdf
- Northern Cross (Yukon) Ltd., 2014b. Open house presentations June 16-18, 2014: Whitehorse, Mayo, Old Crow and Dawson. http://www.northerncrossyukon.ca/upload/news_item/11/02/community-open-house-presentations-june-2014.pdf
- Northern Cross (Yukon) Ltd., 2014c. Northern Cross (Yukon) Limited presentation to Yukon Select Committee on Hydraulic Fracturing, January 31, 2014. http://www.northerncrossyukon.ca/upload/news_item/10/03/yukon-select-committee-on-hydraulic-fracturing-presentation.pdf
- Northern Cross (Yukon) Ltd., 2014d, Northern Cross 3D seismic program. <http://www.northerncrossyukon.ca/operations/3d-seismic-program.html>
- National Energy Board, 2014. Assessment of discovered conventional petroleum resources in the Northwest Territories and Beaufort Sea. National Energy Board, November, 2014. ISSN 978-1-100-25321-3. <http://www.neb-one.gc.ca/nrth/pblctn/2014ptrlmrsrc/index-eng.html#nt>
- Yukon Government Oil and Gas Resources Branch, 2014. Yukon oil and gas exploration regions. http://www.emr.gov.yk.ca/oilandgas/pdf/basins_final.pdf