

ConocoPhillips Canada Resources Corp.
EL 470 - 2016 Groundwater Monitoring Well Abandonment Program
Plain Language Summary

ConocoPhillips Canada (CPC) acquired Exploration Licence (EL) 470 from Aboriginal Affairs and Northern Development Canada in 2011. In 2015, EL 470 was transferred from AANDC to the Government of Northwest Territories Office of Regulator of Oil and Gas Operations in response to devolution. This licence, together with authorizations from the Sahtu Land and Water Board and the National Energy Board, permitted CPC to explore the area for oil and gas resources in EL 470 parcel located in the central part of the Mackenzie River valley south of Norman Wells, Northwest Territories. A groundwater monitoring program was implemented by CPC to provide baseline groundwater data in association with the exploration program.

Figure 1 provides a site location of EL 470 and Figure 2 is the CPC survey of the activity area of EL 470.

In 2013 and 2014, CPC drilled and tested two vertical (O-06 and N-20) and two horizontal (E-76 and P-20) oil and gas exploration wells. Four groundwater monitoring wells (WW02-A, WW02-B, WW04-A and WW05-A) were installed in 2013. In 2015, CPC decided to abandon the exploration and groundwater monitoring wells.

Prior to proceeding with the coordination and planning of the abandonments, CPC notified the appropriate regulatory agencies of their intent to abandon the wells. Among the agencies contacted were the Sahtu Land and Water Board, Office of the Regulator of Oil and Gas Operations, and GNWT Environment and Natural Resources.

Abandonment of the groundwater monitoring wells was completed between January 29 and March 2, 2016.

The groundwater monitoring well abandonment program was conducted in the following sequential order.

- 1) Sampling the wells that had pumps. The three wells with pumps were WW02-A, WW04-A and WW05-A. Well WW02-B had a pump but it had to be removed because permafrost interfered with the pump operation.
- 2) Samples from the three pumped wells were collected for laboratory analysis.
- 3) Wells were thawed with steam to ease the pump removal and clear the inside of the wells prior to filling the wells with cement.

- 4) Pull the pumps from the wells (except for well WW02-B which had no pump or infrastructure).
- 5) Plug each well using Arctic Set Cement followed by cutting and capping the wells.

Abandonment of the four baseline groundwater wells has been completed successfully.

The range of drilled groundwater monitoring well depths resulted in the identification of two and possibly three distinct groundwater units.

The shallower wells (WW02-A, WW02-B and WW05-A) were completed in the Little Bear Formation.

The deepest well (WW04-A) was completed in the Slater River Formation.

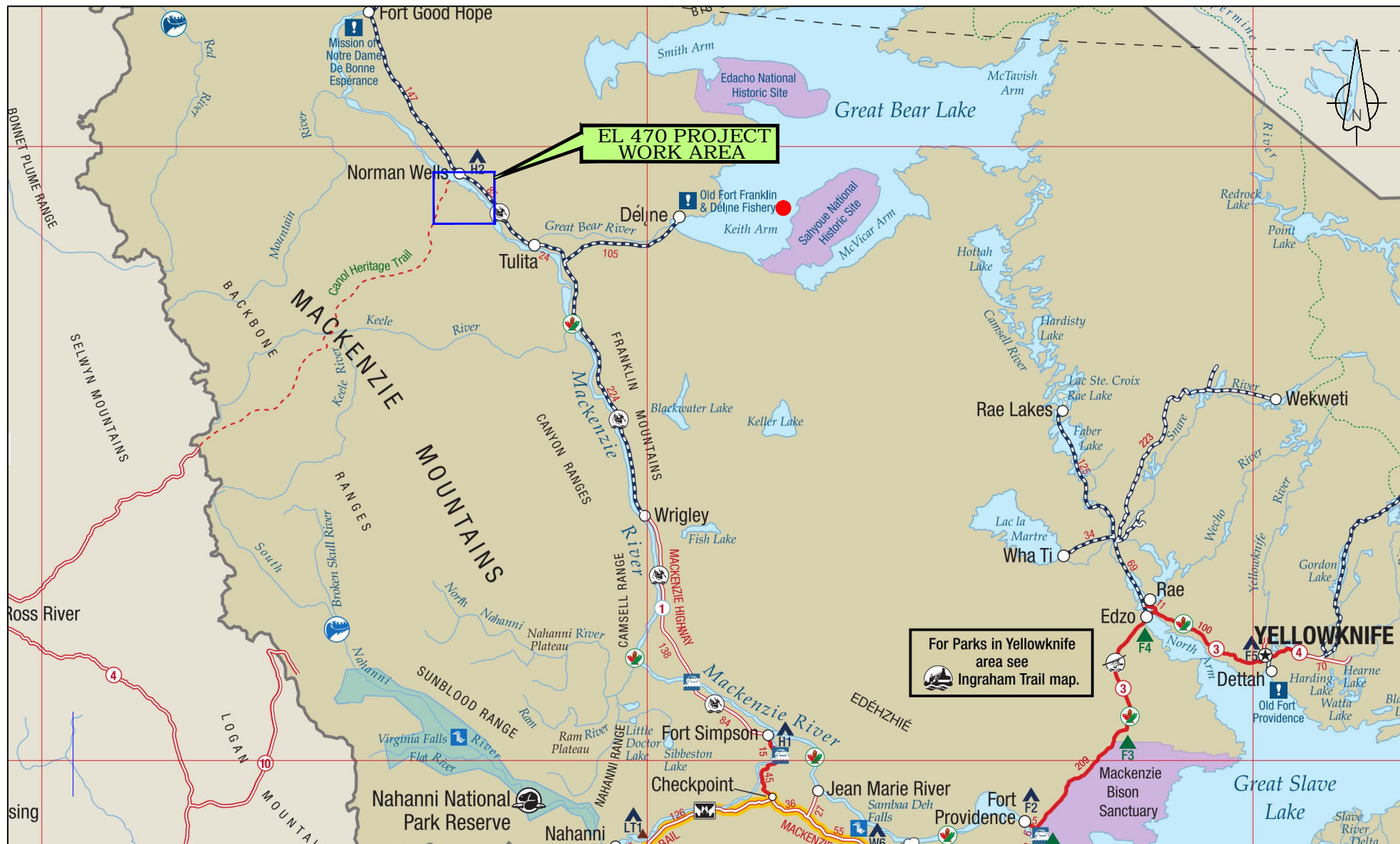
Water quality results obtained from the three shallower wells (WW02-A, WW02-B and WW05-A) indicates water in these wells is potable.

Water quality results obtained from the deepest well (WW04-A) indicate this water is not potable.

The three shallowest wells also produced greater volumes of water than the deeper well.

Well WW02-A produced the greatest volume of water approximately 225 liters per minute and well WW04-A produced the lowest volume of water approximately 2 liters/minute.

The depth of permafrost in the area of the wells ranged between 33 to 70 m. The maximum depth of influence for the permafrost was greater than what was expected in planning the baseline groundwater work.



CONOCOPHILLIPS
EL 470 PROJECT WORK AREA
SITE LOCATION MAP

*HOBBS
ENVIRONMENTAL*

Sampled Date:
APRIL 29, 2016

Drawn by:
JMM

Checked by:
JP

Filename:
EL 470 FIGURE 1

Figure No.

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