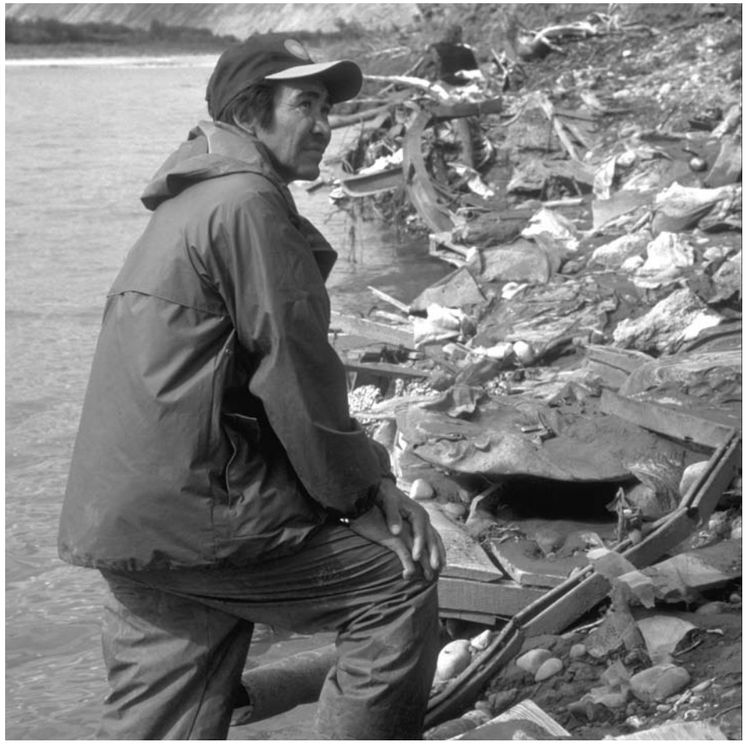
oil & gas



In the late 1980's, debris from former oil and gas exploration projects eroded out of the banks of the Peel River. The material was buried in the late 1960's and is now exposed. Peter Kay, of Ft. McPherson at the site where clean-up efforts are underway. [JP]

Sandstone, limestone and other sedimentary rock can under certain conditions contain oil and gas. Oil and gas is formed when the remains of tiny marine plants and animals that lived 50 million years ago experienced immense pressure and extremely high temperatures over a long period of time. Oil and gas can subsequently be found in source rock (rock which contained the living tissue of these plants and animals), in reservoir rock (rock with lots of interconnected pore spaces that hold the petroleum), or in cap rock (a non-porous rock that trapped the oil or gas and prevented it from escaping).

Exploration for oil and gas deposits involves using explosives to generate seismic waves and measuring the time it takes for these waves to travel from the source to a series of geophones. These geophones are generally set up at intervals along a straight line, called a seismic line. The signal waves are then used to help map the underground layers of the earth's crust.

These underground maps help companies determine where the oil and gas deposits are. Once a potential deposit is identified, wells are drilled to see whether oil or gas is present. In the Yukon most discoveries have been made at depths ranging from 600 to 5000 metres.

Traditionally seismic lines were created by cutting down all trees and shrubs in a straight line, allowing for access of equipment. In recent years there has been a push for less destructive methods of seismic exploration, to reduce the impacts on wildlife, wildlife habitat, permafrost and the landscape as a whole. Some of the low-impact seismic techniques involve the use of helicopters, reducing the width of seismic lines from the traditional 8 metres to 1.5 metres, allowing seismic lines to meander rather than being a straight line, and controlling access along seismic lines.

As well, newer technology now allows a number of wells to be drilled from the same location through directional drilling. In the past, wells were only drilled vertically, requiring a new location for each well.

When the government-built Dempster Highway provided access to the Eagle Plains area in the 1950s and 1960s, oil exploration companies cut and bulldozed hundreds of kilometers of seismic lines and access trails throughout the Eagle Plains area. This grid of disturbed and fragmented tundra and taiga is still visible on the landscape a half century later.

In more recent years, the Yukon Government has identified those areas in the Yukon that have potential for hosting oil and gas deposits. These areas are called sedimentary basins. There are 8 sedimentary basins currently identified in the Yukon. The Peel Plateau Basin and Bonnet Plume Basin fall within the Peel River Watershed. Part of the Eagle Plains Basin also enters the watershed.

Heliportable drill rigs are another lower-impact exploration technique, seen here at Eagle Plains. [CJ]

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Within the Peel River watershed itself, the only region affected by seismic lines is the Peel Plateau Basin, in particular the lower Snake River country and the Caribou and Trail River watersheds further downstream.

Surface exploration here started in the mid 1950s. One well was drilled in September of 1965 but it was found to be dry and was abandoned. Eighteen more wells were put in between 1965 and 1977, all of which were also dry and abandoned. Most of the exploration took place in 1966 and 1967 and approximately $33 million was spent on drilling. The seismic lines were put in from the mid 1960's to the mid 1970's. They were put in by Amoco Canada Petroleum Company Ltd., Gulf Canada Resources Inc., Shell Canada Resources Limited, and Mobil Oil Canada Ltd.

Exploration in the Bonnet Plume Basin has been very limited. There have been no seismic lines run and no wells drilled.

Surface exploration in the region of what is now known as the Eagle Plains Basin started in the mid to late 1950s. The first well was drilled in July 1958 and was classified as dry and abandoned. The second well was drilled by Western Minerals in May 1960. This well was the first discovery and flowed gas. Since then 28 more wells have been drilled with a few further discoveries. The most recent well was drilled in 1985, however the last discovery was in 1965.

Oil and Gas Disposition Process

Under the Yukon's Oil and Gas Act, rights to oil and gas deposits are granted by the Minister responsible for these resources (currently the Minister of Energy, Mines and Resources) according to a process called a disposition. The following are the steps involved in the disposition process:

Step 1: Information Gathering

The Yukon Government's Oil and Gas Management Branch identifies a broad area of interest where there is potential for oil and gas to occur. All First Nation settlement lands are excluded from the area of interest. At this stage government representatives are required to consult with First Nation governments and Renewable Resource Councils to discuss possible areas of conflict and ways to protect cultural, economic and wildlife values.

Step 2: Government to government consultations

Direct consultations with First Nations governments take place. Call boundaries are reviewed.

Step 3: Call for Nominations

The Minister makes a final decision on what areas will be included in the Call for Nomination and this is publicly announced. Exploration companies are invited to identify specific areas within the Call area that they are interested in bidding on.

Step 4: Review Process

The areas that the interested companies have nominated are reviewed. The purpose of this review is to identify any environmental, socio-economic or surface

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Traditional seismic lines are visible in the Eagle Plains region decades after they were cut. [CJ]

access concerns. The intent is that these issues and concerns are then taken into account when the government prepares its Call for Bids. The Minister decides on which areas to proceed with a call for bid on.

Step 5: Call for Bids and Issuance of Disposition

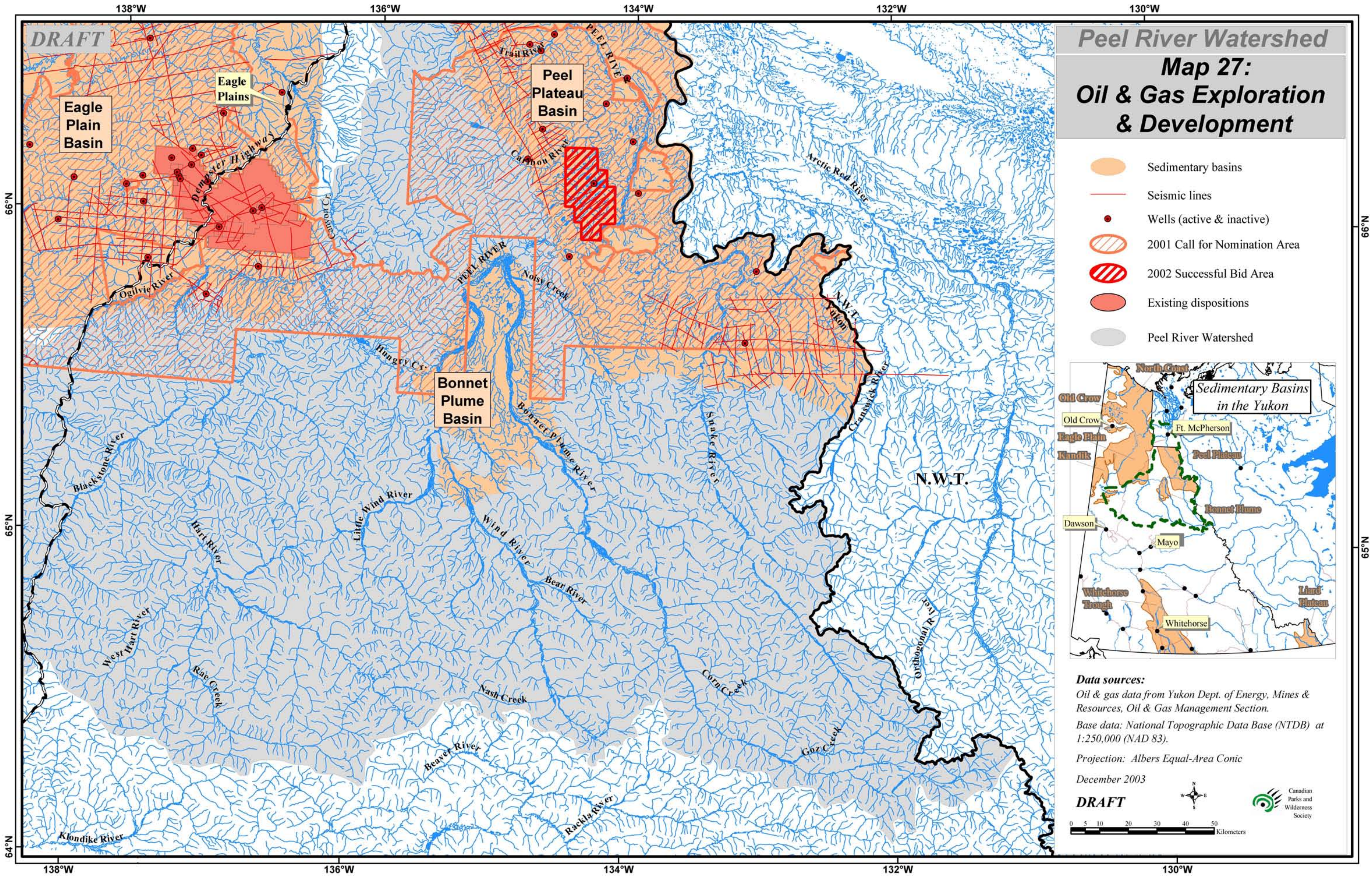
Companies are asked to bid on an area. The successful bidder is the company that commits to performing the most work. A disposition is issued to the successful bidder. The disposition grants oil and gas rights for specific locations only.

Prior to the successful company being able to undertake activities in their disposition area, they must apply for a license pursuant to the Oil and Gas Act. This triggers an environmental screening process.

The existing dispositions shown on Map 27 were awarded in 1988, 1999, 2001 and 2002. In 2002 Hunt Oil Canada was awarded the rights to oil and gas in the Turner Lake wetlands (labeled as 2002 Success Bid Area on the map). This disposition was controversial. The Turner Lake wetlands (also known as the Peel Plateau wetlands) are very sensitive wetlands home to many waterfowl and nesting Peregrine Falcons (see Section 17 where this wetland complex is described in more detail). The entire wetland complex is in a fine balance as a result of permafrost in the region. Any activity that would disturb the permafrost and cause it to melt (as oil and gas exploratory activity tends to do) can result in the draining of the whole wetland area.

Other contentious issues relating to the disposition process have included the consultation process and concerns that the rights to large parts of Yukon land are given to industry prior to any type of land use planning.

Sources: Hannigan, 2000; National Energy Board 2000a and 2000b; YTG Department of Energy, Mines and Resources website; YTG Department of Energy, Mines & Resources, oil & gas digital data, 2003.


DRAFT
Peel River Watershed
Map 27:
Oil & Gas Exploration & Development
Sedimentary basins
Seismic lines
Wells (active & inactive)
2001 Call for Nomination Area
2002 Successful Bid Area
Existing dispositions
Peel River Watershed
Eagle Plain Basin
Eagle Plains
Peel Plateau Basin
Bonnet Plume Basin
Dempster Highway
Trail River
Peel River
Caribou River
Arctic Red River
Ogilvie River
Noisy Creek
N.W.T.
Yukon
Hungry Cr.
Bonnet Plume River
Snake River
Cranswick River
Blackstone River
Little Wind River
Wind River
Hart River
Bear River
West Hart River
Rae Creek
Nash Creek
Corn Creek
Goz Creek
Orthogonal River
Beaver River
Rackla River
Klondike River
N.W.T.
Sedimentary Basins in the Yukon
North Coast
Old Crow
Old Crow
Eagle Plain
Kandik
Ft. McPherson
Peel Plateau
Bonnet Plume
Dawson
Mayo
Whitehorse Trough
Whitehorse
Liard Plateau
Data sources:
Oil & gas data from Yukon Dept. of Energy, Mines & Resources, Oil & Gas Management Section.
Base data: National Topographic Data Base (NTDB) at 1:250,000 (NAD 83).
Projection: Albers Equal-Area Conic
December 2003
DRAFT
Canadian Parks and Wilderness Society
Kilometers
138°W
136°W
134°W
132°W
130°W
66°N
65°N
64°N