

Addendum

Since its initial release on August 17, 2004, the following changes have been identified and should be made to this document; incorrect text in bold and new or revised text is in italics.

Regional Details: Northwest Territories, page 10:

- Sentence reads: However, an analysis of wells in the Deh Cho First Nation territory revealed that all producing wells are less than **6** kilometres north of the Northwest Territories border.
- Sentence should read: However, an analysis of wells in the Deh Cho First Nation territory revealed that all producing wells are less than *60* kilometres north of the Northwest Territories border.
- The proper reference for this sentence is: *Petr Cizek. Value of Deh Cho Oil and Gas Production and Royalties. Prepared for Deh Cho First Nations, August 18, 2003.*

This NWT appendix has been updated to reflect these changes.

Regional Details: Northwest Territories

The regulation and management of oil and gas production in the Northwest Territories is the responsibility of the federal government. The federal government owns and manages more than 90 percent of petroleum rights in the Northwest Territories. As such, the federal government administers and collects royalties and taxes associated with oil and gas production in the region. In this appendix, we describe the methods the federal government uses to obtain revenues from oil and gas production in the territory. We present quantitative estimates of revenues as well as cost and resource value figures over the study period, and discuss environmental impacts associated with oil and gas production in the territory. We begin with background information on oil and gas production in the Northwest Territories.

Background

In this section, we identify the government authorities that play a role in regulating, managing and/or facilitating oil and gas production in the Northwest Territories. For each authority, we provide a brief description of its relevant responsibilities. We also present background information on the oil and gas sector, with figures for oil and gas production, employment in the oil and gas sector and gross domestic product associated with oil and gas production in the Northwest Territories.

Responsible Authorities

The federal government is currently responsible for managing petroleum rights, issuing licences, and setting and collecting oil and gas royalties for subsurface rights in the Northwest Territories.¹ In contrast to Yukon Territory, where a devolution process transferred regulatory power over oil and gas production to the Yukon government, in the Northwest Territories regulation of oil and gas production is being transferred on a region-by-region basis. Aboriginal governments that have settled land claims are responsible for their own petroleum subsurface rights and are thus able to levy royalties on relevant oil and gas developments.² Within the federal government, the management of oil and gas resources on Crown land is the joint responsibility of the following departments:

1. The **Northern Oil and Gas Directorate** of the **Department of Indian Affairs and Northern Development (DIAND)**³ administers the *Canada Petroleum Resources Act*. The *Canada Petroleum Resources Act* governs the allocation of Crown lands to the private sector, tenure to the allocated rights, and the setting and collection of royalties.
2. The **National Energy Board** administers the *Canada Oil and Gas Operations Act*. The *Canada Oil and Gas Operations Act* regulates industrial activities with respect to resource conservation, environmental protection and the safety of workers.

¹ See www.gov.nt.ca/RWED/mog/oil_gas/issues.htm.

² Op. cit.

³ The Department of Indian Affairs and Northern Development (DIAND) has changed its name to Indian and Northern Affairs Canada (INAC). In this report, we use the old name and abbreviation, DIAND, because many people are familiar with that name and because the legislation that set up the department has not been changed, so the Minister is still officially the Minister of DIAND. However, the federal government prefers to identify the department by its new name, Indian and Northern Affairs Canada (INAC).

Oil and Gas Production in the Northwest Territories

Rising gas prices, combined with a number of First Nations land claim settlements in the last decade, have renewed interest in oil and gas exploration in the Northwest Territories. The petroleum-bearing areas of the territory are located in, but not restricted to, the western Northwest Territories, stretching from the Deh Cho at the Alberta–Northwest Territories border to the Mackenzie Delta/Beaufort Sea, and on to the Sverdrup Basin near Melville Island. Oil production from the Norman Wells oil field has been taking place since 1943. An expansion in 1985 and the completion of a pipeline to Zama, Alberta, have enabled the well to operate at full potential in recent years. Large natural gas discoveries on the Liard Plateau, which is well connected to southern markets by pipelines, are resulting in initial production rates of up to 50 million cubic feet per day.⁴ In 2000, the federal government made new lands available for exploration in the Mackenzie Delta/Beaufort Sea. The oil and gas industry responded quickly with bids totaling roughly \$400 million and work commitments of \$1 billion.⁵ A consortium of oil and gas companies⁶ filed a Preliminary Information Package for a Mackenzie Gas Project in the spring of 2003, which outlines plans for developing sweet natural gas from three onshore natural gas fields in the Mackenzie Delta and transporting it to market by pipeline. Combined, the three developments account for 164 billion m³ (Gm³) or 5.8 trillion cubic feet (Tcf) of natural gas. If the project proceeds, it is expected that other onshore and offshore sources of natural gas will be developed and “tied in” to the pipeline.

Table 1 shows oil and gas production from 1995 to 2002, inclusive. As the figures indicate, oil production has remained relatively constant over the study period, while gas production has increased. Total production in the territory increased by 14 percent between 1995 and 2002, but remains relatively low compared to the expected growth if the Mackenzie Gas Project proceeds.

Table 1 Oil and gas production, Northwest Territories, 1995 to 2002, million BOE

PRODUCTION	1995	1996	1997	1998	1999	2000	2001	2002
Oil	11	10	10	10	10	9	9	9
Gas	1	1	1	1	0	3	6	5
Total	12	11	11	11	10	12	15	14

Source: Canadian Association of Petroleum Producers and Statistics Canada

Oil and Gas Employment in the Northwest Territories

Table 2 presents direct employment figures for oil and gas production in the Northwest Territories from 1995 to 2002.⁷ The table shows total employment figures for the territory, as well as the share of total employment attributable to oil and gas production. The figures indicate that both total employment and employment associated with oil and gas production increased between 1995 and 2002, by 11 percent each. The share of total employment attributable to oil and gas production remained the same between 1995 and 2002.

⁴ See www.gov.nt.ca/RWED/mog/oil_gas/history.htm.

⁵ *Op. cit.*

⁶ Imperial Oil, Aboriginal Pipeline Group, ConocoPhillips, Shell Canada, ExxonMobil.

⁷ Employment figures prior to 1999 include Nunavut.

Table 2 Employment associated with oil and gas production and total employment, Northwest Territories, 1995 to 2002

EMPLOY'T	1995	1996	1997	1998	1999	2000	2001	2002
Oil and Gas	436	416	399	388	352	409	497	476
Total	23,617	24,952	25,314	25,344	21,397	21,874	24,257	25,993
% of Total	2%	2%	2%	2%	2%	2%	2%	2%

Source: Statistics Canada, CANSIM Table 383-0009

Oil and Gas Gross Domestic Product in the Northwest Territories

Table 3 presents gross domestic product (GDP) associated with oil and gas production, total provincial GDP, and oil and gas GDP as a percentage of GDP generated by all industries. The figures in the table demonstrate that between 1995 and 2002, the oil and gas sector in the Northwest Territories constituted a slightly declining share of “all industries” GDP in the territory. Indeed, between 1995 and 2002, GDP associated with oil and gas declined by 36 percent, while “all industries” GDP increased by 13 percent.⁸

Table 3 GDP associated with oil and gas production and territorial GDP, Northwest Territories, 1995 to 2002 (million 2000\$)

GDP	1995	1996	1997	1998	1999	2000	2001	2002
Oil and Gas ⁹	218	208	199	186	132	195	216	170
All Industries	2,730	2,870	2,813	2,716	2,398	2,580	2,966	3,031
% of Total	8%	7%	7%	7%	6%	8%	7%	6%

Source: Oil and gas figures from Statistics Canada, CANSIM Table 379-0025

Oil and Gas Revenue Generation

The Government of Canada issues rights to oil and gas companies to produce oil and gas resources in the Northwest Territories. Rights are granted through a competitive bidding process, which begins with a call for nominations through which industry specifies blocks of land of particular interest. Crown rights are then issued through an open, competitive bidding process. Once rights are issued, in the form of an Exploration Licence or a Production Licence, the government collects royalties and other fees from oil and gas producers. Table 4 lists the fees collected by the federal and territorial governments in return for the right to develop oil and gas resources in the Northwest Territories.

⁸ The increase in “all industries” GDP is largely due to increased diamond mine activities in the Northwest Territories over this period.

⁹ Includes a degree of coal manufacturing.

Table 4 Key means of revenue generation, Northwest Territories

COMPONENT	KEY ATTRIBUTES
Royalties	The royalty regime governing oil and gas developments in the Northwest Territories features royalty rates starting at 1% and rising by 1% every 18 months, to a maximum of 5%, until project payout. After project payout, royalties are capped at the greater of 30% of net revenues or 5% of gross revenues.
Licences	Licences are issued following a call for bids in which the highest bidder receives rights to blocks of land.
Corporate Income Tax	The corporate income tax rate in the Northwest Territories is 14.0%.
Federal Income Tax	The net federal corporate income tax rate for oil and gas companies is 28%, against which the government allows a number of deductions.

Several deductions and credits are available to oil and gas producers in the Northwest Territories. These are briefly described in Table 5.

Table 5 Key deductions and credits related to oil and gas, Northwest Territories

COMPONENT	KEY ATTRIBUTES
Federal Capital Cost Allowance	A deduction against income for depreciating property; Class 41 covers oil and gas equipment and allows a 25% writedown on equipment on a declining balance basis.
Federal Resource Allowance	A notional allowance in lieu of deduction of provincial royalties and freehold mineral taxes; over the study period, the deduction was 25% of taxable net resource profits.
Federal Exploration and Development Expenses	Exploratory and development expenses are grouped into one of three pools: Canadian Exploration Expenses (CEE), Canadian Development Expenses (CDE), and Canadian Oil and Gas Property Expenses (COGPE). The CEE balance of exploration expenditures is fully deductible against income, with any unclaimed portion carried forward indefinitely. Up to 30% of the CDE balance and up to 100% of the COGPE balance can be applied against income.
Federal Earned Depletion	An additional deduction from taxable income of certain exploration and development expenditures and other resource investments. The deductions for earned depletion are generally limited to 25% of the taxpayer's annual resource profits. ¹⁰

Quantitative Results of Revenue Generation

Table 6 demonstrates the trend in revenues obtained from oil and gas producers in the Northwest Territories. The major sources of revenue are royalties and income taxes. Total revenues increased by 335 percent between 1995 and 2002.

¹⁰ While Earned Depletion has been phased out, federal government expenditures related to it continued until 2001.

Table 6 Revenue from oil and gas production, Northwest Territories, 1995 to 2002 (million 2000\$)

REVENUE SOURCE	1995	1996	1997	1998	1999	2000	2001	2002
Royalties	7.3	15.7	13.7	7.8	7.8	11.5	15.5	27.9
Income Taxes ¹¹	7.1	15.0	5.9	5.4	5.4	14.8	23.8	37.1
TOTAL	14.4	30.4	19.4	13.0	13.0	25.8	38.3	62.6

Source: Public accounts of Canada and the Canadian Association of Petroleum Producers.

Table 7 compares trends in revenue with production to determine if the federal and Northwest Territories governments are capturing relatively more or less revenue today than in 1995. The figures in the table show that both revenue and production increased between 1995 and 2002. The increase in the amount of revenue, however, far exceeded the increase in production; between 1995 and 2002, revenue increased by 335 percent and production increased by a mere 14 percent. Correspondingly, revenue per unit of production increased by 281 percent, from \$1.2/BOE to \$4.5/BOE between 1995 and 2002.

Table 7 Revenue generation and production, Northwest Territories, 1995 to 2002

SUMMARY	1995	1996	1997	1998	1999	2000	2001	2002
Revenue (million 2000\$)	14.4	30.4	19.4	13.0	13.0	25.8	38.3	62.6
Production (million BOE)	12	12	11	11	10	12	15	14
Revenue/Production (2000\$/BOE)	1.2	2.6	1.7	1.2	1.3	2.2	2.5	4.5

Economic Rent in the Northwest Territories

Table 8 presents data for the value of oil and gas resources and the cost of oil and gas production annually for the Northwest Territories. Figures are shown as 2000\$/BOE, like the revenue figures in the previous section. The value of oil and gas resources in the Northwest Territories almost doubled between 1995 and 2002. At the same time, the cost of production increased significantly. The high production cost figures in 1998, 2001 and 2002 are due to low production and additional oil and gas reserves in those years. In years of low economic rent, authorities were able to capture a high degree of it. In years of higher economic rent, authorities did a poor job of capturing economic rent.

Table 8 Resource value, production cost and economic rent (2000\$/BOE), Northwest Territories, 1995 to 2002

	1995	1996	1997	1998	1999	2000	2001	2002
Resource Value	15.9	19.6	19.1	15.9	19.9	34.7	33.5	29.5
Production Cost	7.1	13.1	69.3	136.0	5.4	32.3	116.4	311.1
Economic Rent	8.8	6.5	0.0	0.0	14.4	2.4	0.0	0.0
Rent Capture	13%	40%	100%	100%	9%	91%	100%	100%

Source: Value figures from the Canadian Association of Petroleum Producers Statistical Handbook, Cost figures derived as per the methodology section of the report.

¹¹ Includes federal and territorial taxes.

Trends in Associated Environmental Impacts

As the United Nations Environment Programme pointed out in a news release earlier this year, “At the turn of this new millennium less than 15 percent of the Arctic’s land was heavily impacted by human activity and infrastructure. However, if exploration for oil, gas, and minerals, developments such as hydro-electric schemes and timber extraction continue at current rates, more than half of the Arctic will be seriously threatened in less than 50 years.”

Imperial Oil, the Aboriginal Pipeline Group, ConocoPhillips, Shell Canada and ExxonMobil have filed the Mackenzie Gas Project Preliminary Information Package, which outlines plans for developing natural gas from three onshore natural gas fields in the Mackenzie Delta and transporting it to market by pipeline. Combined, the three developments account for 164 billion m³ (Gm³) or 5.8 trillion cubic feet (Tcf). Expressions of interest from other potential gas suppliers, including the three so-called “anchor fields,” suggest an initial gas volume of 34 million m³ per day, or 1.2 billion cubic feet per day, may be shipped by the pipeline.

If approved and constructed, this Mackenzie Valley Pipeline would be the largest industrial development to occur in the North. The Preliminary Information Package also notes that the pipeline is expected to operate for at least 25 years. Initial development would occur from very large individual wellpads using directional drilling to drill six to 15 wells, depending on the depth of the reserve in the field. Over time, more wellpads (both large and small) would be added to exploit the full resource. The wellpads would need flare stacks, disposal wells, utility facilities, living quarters, service buildings, helicopter pads, connections to gathering pipelines and various field processing facilities (dehydration, line heaters, field compression).

If the pipeline is constructed, other production areas onshore and offshore may be developed. Each area would have its own wells and associated facilities and, as the initial wells are depleted, new wells would be needed to maintain or increase the supply of gas for the pipeline. Oil and gas development would likely occur where reserves can be found along the pipeline route, following a pattern similar to gas field development in northern Alberta and British Columbia, as described in the box below.

Typical Pattern of Oil and Gas Development

Starting with the most prolific reservoirs closest to the pipeline, companies begin to build permanent roads and wellpads and start to drill permanent production wells. Smaller diameter “gathering” pipelines are constructed to connect production wells to processing facilities. The processing facilities, in turn, are connected by pipeline to the large transmission pipeline. By the time pipeline construction has been completed, enough production wells, gathering system pipelines and processing facilities will also have been completed to generate enough gas to fill the pipeline for at least the first several years.

As the initial wells are depleted, new wells are drilled to maintain or increase the supply of gas for the pipeline. As a result, there is ongoing seismic exploration and drilling in producing areas, as well as in new areas on the edges of the producing area.

This pattern continues until the initial reserves of oil or gas, and any new oil or gas found after the decision to build the pipeline, are depleted or are no longer economically attractive to produce.

Land Disturbance

There are numerous environmental concerns associated with oil and gas activity, ranging from land disturbance and disruption of fish habitat to air pollution and damage caused by accidental spills. This section summarizes the land disturbance issues associated with oil and gas exploration and development.

Oil and gas exploration and production require extensive land clearing and infrastructure construction. Seismic cutlines, temporary and permanent roads, wellpads, camps, pipeline right of ways, processing facilities and airstrips or helicopter pads disturb the surface of the land and leave breaks or separations in ecosystems.

Over the life of an oil and gas producing area, the combination of repeated seismic surveys and land disturbances associated with drilling wells, operating well sites and constructing and operating pipelines can result in cumulative impacts. In areas where there are a lot of cutlines, right of ways and roads, wildlife and wildlife movement are affected. For example, although woodland caribou often cross cutlines to access adjoining habitat, they will generally avoid being within 250 metres of these lines.¹² Oil and gas infrastructure, combined with traffic and the continuous noise associated with drilling rigs, well sites and pipeline compressors, can also disturb wildlife. For example, Arctic caribou in oil and gas producing areas in Alaska are more vulnerable to predators, are exposed to more stress, which can affect reproductive productivity, and are forced to modify movement patterns.¹³

Seismic lines, roads and right of ways also provide extensive and long-term access to hunters, fishers, and industrial and recreational users, which can have a severe impact on wilderness areas and wildlife populations. While the impacts from a single well or road are relatively minor, the number of wells, roads and pipelines required to exploit a large oil or gas reserve lead to cumulative impacts.

Oil and gas development in Alaska started in 1960 with one producing oil field. By 2001, oil development comprised 19 producing fields, 20 pads with processing facilities, 115 pads with support facilities, 91 exploration sites, 13 offshore exploration islands, 4 offshore production islands, 16 airstrips, 1,395 culverts, 960 kilometres of roads and permanent trails, 725 kilometres of pipeline corridors, 353 kilometres of transmission lines, and gravel mines affecting 2,600 hectares.¹⁴

The Northwest Territories is already experiencing impacts associated with existing oil and gas developments. The focus of gas production in the territory is in the Fort Liard region. To investigate the extent of gas exploration and development impacts on the Fort Liard region, the Canadian Arctic Resources Committee with the Canadian Parks and Wilderness Association contracted Cizek Environmental Services.¹⁵ The consultants estimated the cumulative effects of industrial development on the Fort Liard region of the Northwest Territories using the United

¹² Dyer, Simon. *Movement and Distribution of Woodland Caribou in Response to Industrial Development in Northeastern Alberta*. Master of Science Thesis. Edmonton, Alberta: University of Alberta, 1999. Also available online at www.deer.rr.ualberta.ca/caribou/SD_MSc.pdf.

¹³ Truett, J. and S. Johnson. *The Natural History of an Arctic Oil Field: Development and Biota*, 2000.

¹⁴ National Research Council of the National Academies, *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope*, March 2003.

¹⁵ See www.carc.org/whatsnew/index.php3.

Nations Environment Programme's Globio Methodology for Mapping Human Impacts. The study considered the spatial impact (in terms of area of land disturbed and associated ecosystem impacts) of access roads, pipelines, wells, buildings, seismic lines, highways, communities and logging. Table 9 shows the results of the study for 2001.

Table 9 Estimated cumulative impacts in 2001

IMPACT TYPE	AREA IMPACTED	PERCENTAGE OF STUDY AREA
High risk of reduced survival/abundance of birds	234 km ²	1.7%
High risk of reduced survival/abundance of large mammals	5,609 km ²	39.6%
High risk of effects on plants, animals and food chains	2,022 km ²	14.3%

Source: Fort Liard Area Cumulative Impacts Mapping Project Technical Report

In addition to the analysis above, the consultants forecasted the impact of future developments in the area, assuming that the current rate of development continues. They concluded that by 2010 the impact area would cover roughly half of the study area, and by 2050 the impact area would cover virtually all of the study area.¹⁶

The experience of the Fort Liard region demonstrates the potential impacts of rapid development on a particular area. Although the Liard Valley is not necessarily representative of future developments in the Northwest Territories,¹⁷ the impacts realized in this area are indicative of what could occur in other regions should development patterns mirror those of the Fort Liard area.

Summary

The trend in revenue generation in the Northwest Territories mirrors the trend in commodity prices. Figure 1 shows this clearly.

¹⁶ One of the key outcomes of this analysis was recognizing the need for better mapping and impact documentation for oil and gas activities in terms of land disturbances.

¹⁷ There are topographical, climatic, soil and ecotype differences between regions, so it is not appropriate to say that impacts will be uniform. In addition, some of the developments that have taken place in the Fort Liard region occurred when environmental practices were less stringent.

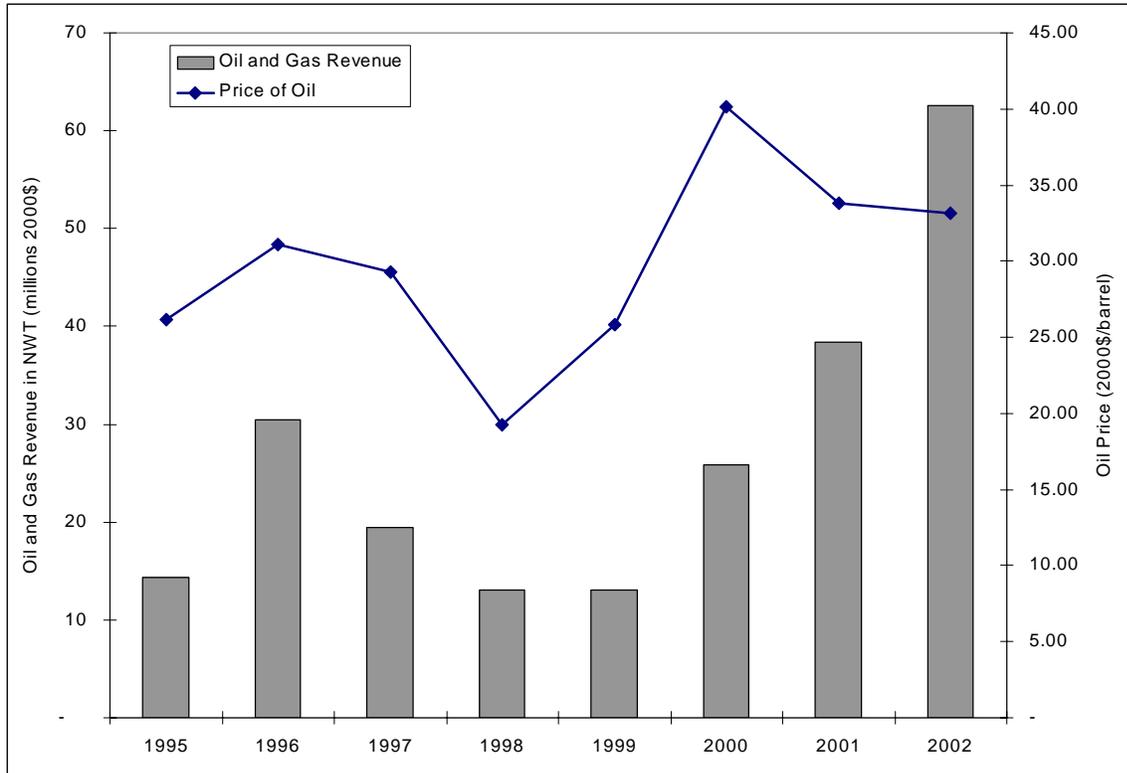


Figure 1 Trends in revenue generation in the Northwest Territories and the price of oil (2000\$), 1995 to 2002

The Northwest Territories has the lowest level of revenue generation of any region considered in this analysis. While the Northwest Territories has a relatively high resource value, it also boasts high production costs which resulted in little rent available in select years over the study period. In years where substantial rent was available, authorities in the Northwest Territories have done a poor job of capturing it. The territory, like Yukon Territory, with its relatively small population and economy, is more vulnerable than Alberta, British Columbia and Saskatchewan. Smaller populations make for less diverse and resilient economies that are more sensitive to boom and bust economic cycles. As in Yukon Territory, in the Northwest Territories communities need protection from large developments that can cause significant, temporary and unsustainable spikes in economic performance. A key component in providing this stability is to develop appropriate resource management regimes.

Lower royalty rates in the Northwest Territories are often justified by the federal government on the basis of higher exploration and development costs relative to neighbouring Alberta or British Columbia. However, an analysis of wells in the Deh Cho First Nation territory revealed that all producing wells are less than 60 kilometres north of the Northwest Territories border.¹⁸ South of the border, in Alberta and British Columbia, a significant amount of oil and gas activity is taking place, yet oil and gas producers in these jurisdictions pay significantly higher royalty rates.

¹⁸ Petr Cizek. Value of Deh Cho Oil and Gas Production and Royalties. Prepared for Deh Cho First Nations, August 18, 2003.

Some of the costliest and deepest wells in North America are in British Columbia's foothills, not in the Deh Cho.¹⁹

The process for obtaining revenues from oil and gas developments in the Northwest Territories is complicated by the current process of authority transfer from the federal government to the territorial government. Elaborate agreements specify that as revenues from certain taxes collected by the territorial government increase, federal transfer and grant payments are reduced. Thus, increasing royalty rates in the Northwest Territories will not necessarily result in more revenue for the territory as a whole. This situation will change once the transfer of authority is complete. In the meantime, however, raising royalty rates is not the only means to obtain revenues in the region. The Northwest Territories government has several other options, including introducing a system of taxes and fees that would not be subject to federal clawback. The Northwest Territories government has not seriously considered implementing a surtax on high-profit resource corporations, a hydrocarbon production tax, a carbon tax or a capital investment tax.²⁰ All of these mechanisms could help the territorial government capture more revenue from oil and gas production.

Until 1994, relatively little exploration activity was taking place in the Northwest Territories. There was a moratorium on drilling in the Mackenzie Valley area because of unsettled Aboriginal land claims. The Department of Indian Affairs and Northern Development did not issue any exploration rights between 1977 and 1994. As First Nations complete land claim negotiations, oil and gas production will likely increase. Rights are now being issued annually in all parts of the territory where no opposition exists from Aboriginal people.²¹ As land claims are settled, First Nations gain subsurface rights and the authority to collect royalties from oil and gas developments, which they have been doing with significant success.²²

¹⁹ Cizek, Petr. *Value of Deh Cho Oil and Gas Production and Royalties*. Prepared by Cizek Environmental Services for Deh Cho First Nation, 2003.

²⁰ Cizek, Petr. *Bankrupting the North with Resource Extraction: A Royalty Rip-off*. Yellowknife, NWT, 2003.

²¹ See www.gov.nt.ca/RWED/mog/oil_gas/issues.htm.

²² For example, the Inuvialuit Regional Corporation used a cash bid system to distribute oil and gas rights and received \$75 million for four parcels of land.