



Northern Oil and Gas Annual Report 2001

The management of oil and gas resources on Crown lands north of 60° N. latitude in the Northwest Territories, Nunavut and the northern offshore is a federal responsibility carried out by the Northern Oil and Gas Directorate of the Department of Indian Affairs and Northern Development.

Petroleum resource management on Crown lands is exercised under federal legislation. The *Canada Petroleum Resources Act* and its regulations govern the granting and administration of Crown exploration and production rights and set the royalty regime. The *Canada Oil and Gas Operations Act* governs the regulation of petroleum operations and associated benefits requirements. Land, royalty and benefits matters are managed by the Department on behalf of the Minister of Indian Affairs and Northern Development while the National Energy Board takes the lead role in approval of operations.

Information on the northern oil and gas regime may be found on the web at: <http://www.ainc-inac.gc.ca/oil/>



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***Message from the Honourable Robert D. Nault
Minister of Indian Affairs and Northern Development***

The year 2001 saw increasing expenditures by the oil and gas industry on exploration and development in the North. This positive trend in northern economic development was stimulated by demand for natural gas and related work on defining potential pipeline projects to bring Arctic natural gas into the continental energy market.

Especially noteworthy was the major increase in activity in the Mackenzie Delta region as seismic exploration and drilling programs on the exploration licences issued in 1999 and 2000 swung into gear in 2001. The past year saw the first new exploratory well in the Mackenzie Delta drilled after a decade of inactivity. Offshore Beaufort Sea seismic exploration also resumed, heralding the likelihood of more offshore drilling in the future.

An additional gas field came into production in the southern Northwest Territories. This field was able to connect directly to the Shiha Pipeline, constructed in 2000 and brings to six, the number of producing gas fields in the Northwest Territories. This expansion of infrastructure is facilitating economic development in the North. Increased gas production from the North in 2001 also meant a near-doubling of Crown royalty receipts over the previous year.

Five new exploration licences were issued by the Northern Oil and Gas Directorate in 2001, following a successful call for bids in the Central Mackenzie Valley for work commitments totalling \$17.4 million. Following consultation with northern Aboriginal Groups, the territorial governments of Nunavut, Northwest Territories and Yukon and other stakeholders on terms and conditions of issuing licenses, calls for nomination are now issued annually in the Central Mackenzie Valley, the Mackenzie Delta and Beaufort Sea, and in the Arctic Islands of Nunavut.

A focus throughout 2001 was developing a clear and coordinated regulatory framework for offshore exploration to address environmental and safety concerns. Indian and Northern Affairs Canada, recognizing the evolution in technology together with the growing importance of sustainable economic development and environmental issues since previous rounds of offshore activity in the North, continued to work closely with the oil and gas industry, the Mackenzie Valley and Inuvialuit regulatory boards, and federal government regulators to coordinate the assessment and regulatory stages of northern projects.

I invite you to consult this report for more details on these and other developments.

It is with great pleasure that I table before Parliament the 2001 Northern Oil and Gas Annual Report.

Canada's Frontier Lands



Area under the responsibility of the
Minister of Indian and Northern Affairs Canada
Zone qui relève de la compétence du ministre des
Affaires indiennes et du nord canadien

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OVERVIEW OF NORTHERN OIL AND GAS ACTIVITIES

Overview of Oil and Gas Trends

The year has been characterized by extreme price volatility for natural gas. A cold start to the year coinciding with low gas storage levels boosted natural gas prices to unprecedented highs. Average Alberta contract price reached \$14 in January 2001. Prices fell steadily throughout the year; by December the Alberta prices had fallen to a quarter of those prevailing only twelve months before.

Short term volatility in natural gas prices may be expected to deter investment in natural gas exploration, particularly where drilling-to-production cycle times are short. In the North, exploration programs pursue larger fields which can sustain production over several years: given this strategy the negative effect of price fluctuations on investment is dampened. Long term investments such as Mackenzie Delta development are unlikely to be affected provided projections of long term demand for natural gas remain upward.

The roller-coaster ride displayed by natural gas prices has not been mirrored in the oil markets. OPEC discipline in realizing production cuts has maintained oil prices in the face of a world economic downturn and weak demand. Exploration for light crude oil in the North can be expected to remain a potentially attractive economic option, albeit critically dependent on location and quantity of discoveries.

Commodity Prices

	<u>Jan 2001</u>	<u>Dec 2001</u>	<u>Average 2001</u>
Oil	274.37	184.81	246.72
Gas	13.78	3.39	6.09

Average Oil Prices: C\$ per m³ at Edmonton
 Average Natural Gas Prices: AECO C\$ per GJ)
 Source: Natural Resources Canada

Overall, the North is estimated to hold about 20 percent of Canada's known remaining resources of natural gas and oil and 40 percent of potential (conventional light crude only; using an oil/gas equivalency of 6 thousand cubic feet of gas per barrel (1 000 m³ gas per m³ oil)). In terms of natural gas alone, the North holds 23 percent of the remaining discovered resource and as much as 42 percent of potential. Most of Canada's future gas resources lie offshore or in the North. The most accessible of the northern resources lie along the length of the Mackenzie Valley, from the border with the Provinces at 60 degrees, north to the Mackenzie Delta and Beaufort Sea. Comparable in scale but more remote and not currently under consideration for development, are the resources of the High Arctic which span northern Nunavut and the Northwest Territories (NWT).

A feasibility study by a consortium of gas resource owners in the Mackenzie Delta has been underway since April 1999. This study, together with a separate initiative by resource owners on the Alaskan North Slope have created a climate of intense interest in the development of Arctic gas resources.

As the year drew to a close, the Mackenzie Delta Producers Group, comprising Imperial Oil, Gulf Canada, Shell Canada and Exxon Mobil were close to pronouncing on their view of the feasibility of constructing a Mackenzie Valley pipeline to develop Mackenzie Delta gas on a stand-alone basis. These companies report discovered resources of $164 \times 10^6 \text{ m}^3$ (5.8 trillion cubic feet) (tcf) of gas in three fields onshore the Mackenzie Delta. The National Energy Board identifies a total of $255 \times 10^6 \text{ m}^3$ (9 tcf) of discovered resources in the region and further potential of $1\,558 \times 10^6 \text{ m}^3$ (55 tcf).

In addition, several pipeline companies have been advancing alternative pipeline concepts. The result has been an enriching of pipeline options varying in routing, capacity and design. In particular, the potential synergies of an over-the-top route from Alaska through the Beaufort Sea with a Mackenzie Delta stand-alone line are being explored.

Exploration Activity in the North

New drilling declined slightly from 2000 with seven new exploratory wells commenced in 2001. Total metres drilled of 17 400 m was less than the previous year. This total includes 3 723 m drilled for four production wells at Norman Wells field, a scientific test well to test hydrate potential on the Mackenzie Delta, and a training well drilled at Inuvik.

Two exploratory wells were drilling in the NWT on January 1, 2001 and were completed by the end of the month. Winter well operations ended in late March 2001 in the southern NWT, on April 5th in the central Mackenzie Valley, and continued until April 17th on the Mackenzie Delta. Summer well operations were underway at Norman

Wells and at Pointed Mountain field (well abandonments). At year end, one well was drilling in the southern NWT; and two wells in the Mackenzie Delta region one on Crown lands on the Mackenzie Delta and one on Inuvialuit private lands.

In 2001, the North saw heightened geophysical activity reflecting a major increase in operations in the Mackenzie Delta. A total of 31 geophysical and geological field programs were run, comprising 3 251 km of 2-dimensional (2D) seismic and 7 893 km² of 3-dimensional (3D) seismic; 14 620 km of aeromagnetic survey and eight geological programs (split between three industry-led geological field parties and five geochemical studies). A marked preference for 3D seismic acquisition was apparent.

Southern Northwest Territories

The pipeline infrastructure now extending into the southern NWT has facilitated the rapid development of Paramount Resources' Southeast Fort Liard N-01 discovery. This well was drilled between December 12, 2000 and January 16, 2001 on exploration licence EL381 using Precision Drilling Rig #379. After extended flow testing through April and May, the field was brought on-stream in August.

Companies have met their drilling commitment on all current exploration licences in this region. These licences, issued in either 1995 and 1996 are now in their second period and further drilling is not required to hold the licences until term. Instead, companies can focus on delineation of discoveries or the elective drilling of new exploration wells. Accordingly, only one exploratory well and one delineation well

were spudded in this region in 2001, a marked reduction over previous years. Canadian Forest Oil kicked off a second well bore (C-31A) at their North Liard C-31 location to test the Nahanni Formation in a foothills structure north of Chevron's K-29 producer. The well was plugged and suspended. In December 2000, Paramount spudded the Bovie J-76 well on the Bovie anticline using Akita Rig #58.

Although new exploratory drilling was limited, oil and gas activity levels were sustained by operations on nine wells which were re-entered for testing, work-over, recompletion or abandonment. Paramount's Arrowhead C-02 well was re-entered using Precision Drilling Rig #507 for testing, and a work-over was performed on the Fort Liard O-35 well. Five wells were re-entered in the Cameron Hills area for testing and two were recompleted using service rigs. There were two well abandonments at Pointed Mountain field.

Five geophysical programs were run in the southern NWT in the region of Fort Liard and Nahanni Butte. Four of these seismic surveys were 2D heliportable operations in the foothills by Canadian Forest Oil (one exclusive program); Talisman Energy (one exclusive program); Explor Data (two non-exclusive programs), and one exclusive 3D survey by Canadian Forest Oil. A total of 272 km of 2D seismic and 290 km² of 3D seismic were shot. In addition to seismic operations, Canadian Forest Oil ran one geological field program.

Central Mackenzie Valley

Exploratory drilling in the Central Mackenzie Valley was limited to three wells drilled by Devlan Exploration to validate exploration licences nearing the end of their first period. Devlan et al. Tree River B-10 was drilled to 1 294 m on EL386; Thunder River N-73 to 1 146 m on EL373, and Ontaratue River D-39 to 1 250 m on EL374. The wells were drilled using Akita Rig #14 to Paleozoic targets and were plugged and suspended.

Four seismic programs, two surface geochemistry programs and one geological field program were run in the Central Mackenzie Valley in 2001. Northrock Resources operated a 2D heliportable operation on EL397; Devlan undertook a surface geochemical survey and a 2D seismic program on ELs 373, 374 and 386; and two seismic programs were run near Colville Lake, by Paramount Resources, and by Canadian Natural Resources Ltd. on EL400. All programs were exclusive.

Mackenzie Delta

The Mackenzie Delta region saw a major upswing in exploration activity in 2001. Petro-Canada with partner Devon ARL Corp. drilled the Kurk M-15 well on EL395. The well was drilled using the Akita Equetak Rig #60 to test objectives in the lower Tertiary Taglu sands. The well was plugged and suspended at 3 093 m after 66 days. Petro-Canada and partners expect to complete operations at Kurk in 2002, prior to commencing a new well on this licence. Towards year end Devon ARL Corporation spudded the Tuk M-18 well on Inuvialuit lands on the Tuktoyaktuk Peninsula using the Akita Equetak Rig #63E.

Test drilling at Mallik on the Mackenzie Delta resumed in December 2001 with the first well of three planned to test the productive capability of gas hydrates. At year end Japex Canada Ltd. Mallik 3L-38 was at 454 m with a target depth of 1 188 m.

As part of an initiative to accelerate training of local workers for oil and gas operations in the Mackenzie Delta region, Aurora College in Inuvik drilled a 400 m training well. Aurora Training Well Inuvik G-53 was drilled to 400 m using Akita Equetak Rig #15.

Ten seismic programs, three geochemical sampling studies and one geological field party were active in the Mackenzie Delta region in 2001. The seismic programs included four 3D programs exclusively for Chevron (EL394), Petro-Canada (two programs, on EL395 and on EL396), and Devon ARL Corp. (marine seismic combined with a bathymetry survey on ELs 408-411); two programs with 2D and 3D components, one exclusive to Devon ARL Corp. on Inuvialuit lands on the Tuktoyaktuk Peninsula and a second to Shell (EL403); four 2D seismic programs exclusive to Petro-Canada,

to AEC West and to Burlington Resources and a non-exclusive program by Explor Data. Geochemical surveys were performed by Shell, Devon ARL Corp. and Petro-Canada. Petro-Canada complemented the geochemical survey with a geological field party into the Richardson Mountains.

Offshore Nunavut

A marine seismic survey was undertaken by TGS-NOPEC this year in the Labrador Sea between Greenland and Canada in anticipation of a new licensing round in Greenland waters. Seismic data was acquired by the MV Zephyr in August 2001 to assist industry in the regional evaluation of the potential of the entire basin. The program included 1 288 km of marine seismic shot in Canadian waters.

A geochemical seep study using remote sensing data was undertaken by Cannat Resources to evaluate EL297 in Lancaster Sound. The study did not involve surface operations.

Overview of Northern Oil and Gas Activities, 2001

Lands held under licence as of year end (millions of hectares)	5.6
Licences active as of year end	191
(includes exploration, significant discovery and production licences)	179
Licences issued during the year	7
Natural gas production (millions of cubic metres)	1,472.8
Oil production (thousands of cubic metres)	1,432.2
Oil and gas revenues received in 2001 (\$ millions)	24.7
(royalties, rentals, fees, deposit forfeitures)	

OIL AND GAS MANAGEMENT

Rights Issuance

With exploration and development still at a low level relative to potential it is important to sustain industry's interest by issuing new exploration rights on a regular basis. This practice serves to even out activity levels over the course of the years. To this end, the department is promoting regular annual calls in the Central Mackenzie Valley, the Beaufort Sea/Mackenzie Delta and the Arctic Islands of Nunavut.

In accordance with the provisions of land claims settlement agreements, the department sought the views of aboriginal communities and organizations prior to rights issuance on the terms and conditions of the issuance and related matters. The department is also working towards establishing measures that would meet the needs and provide economic opportunities for those areas without a land claim settlement, primarily in the southern NWT.

Crown rights are issued pursuant to an open, competitive bidding process. The bid criterion used is currently the dollar value of work proposed for the first period of the licence. A work program requirement of one well in the first period applies.

Mackenzie Delta / Beaufort Sea

Rights issuance in the Mackenzie Delta / Beaufort Sea region has been an annual event for a decade. A Call for Nominations was launched in November 2000 with the support of the Inuvialuit and Gwich'in and closed on January 12, 2001. No nominations were received. However, two nominations were

received from the 2001-2002 Call for Nominations, launched in November 2001 and which closed on December 17, 2001. A Call for Bids on these blocks is anticipated for January 2002.

Central Mackenzie Valley

A Call for Nominations was launched for the Central Mackenzie Valley on March 12, 2001 and closed on April 9, 2001. The resultant Call for Bids was launched on May 2, 2001 and closed on September 17, 2001.

The bid criterion was the dollar value of the work proposed in the first four years of the eight year licence period. Successful bids totalling \$17.4 million were received for five of the six parcels.

The 2001-2002 Call for Nominations in this region was launched in November 2001 and synchronized with the Mackenzie Delta / Beaufort Sea and Arctic Islands of Nunavut calls. The Call closed on December 10, 2001. One block was nominated. A Call for Bids is anticipated for January 2002.

Arctic Islands of Nunavut

A Call for Nominations was launched in December 2000 for the Arctic Islands of Nunavut. The Call for Nominations closed on January 29, 2001 with no nominations being received. Consistent with the practice of establishing regular annual calls, a second Call for Nominations was issued in November 2001. The Call for Nominations was still open at year end.

The Arctic Islands region contains several areas with high potential for both oil and gas, proven by existing discoveries. The department is optimistic that regular annual calls in Nunavut will stimulate private sector investments in developing these resources.

Interests Issued in 2001

Five new exploration licences were issued as a result of successful calls for Bids in the Central Mackenzie Valley.

Two production licences were issued to Purcell Energy (PL11) and Paramount Resources (PL12) effective April 17 and May 3, 2001 respectively.

Benefits

The oil and gas sector continued to demonstrate its potential to become a significant component of the northern economy. High levels of exploration activity in the Mackenzie Delta and, to a lesser extent, in the central Mackenzie Valley and the southern NWT near Fort Liard and in the Cameron Hills created significant employment, training and business supply and service opportunities. Northerners and northern firms responded positively to these opportunities to benefit from oil and gas activity. The seasonal nature of employment in oil and gas exploration fits well with the dual traditional/wage economy of many communities.

Inuvik, Tuktoyaktuk, Aklavik, Fort Liard and Nahanni Butte experienced high levels of employment and business contracting as a result of continued and new oil and gas exploration. Aurora College, governments, Aboriginal groups and 25 industry partners

joined together to establish a permanent site in Inuvik for training drilling personnel. Many Mackenzie Delta residents as well as others in the NWT and Yukon took this opportunity for training in the North and course completion rates were high. Northern residents also received training prior to and during employment at recently commissioned natural gas production facilities in the Fort Liard area.

The Department's Yellowknife-based Petroleum Development and Benefits Division assumed the lead responsibility for the administration of benefits plans in the NWT, working closely with the Northern Oil and Gas Directorate to complete the transition. Division staff met with the Inuvialuit, First Nations and northern communities to better understand their benefits issues and concerns and to increase public understanding of the *Canada Oil and Gas Operations Act* (COGOA) benefits plan requirement. Extensive consultations were held with First Nations and communities on a proposed benefits plan for Paramount Resources' natural gas development project in the Cameron Hills.

Expenditures

Expenditures on exploration activities totalled \$258.4 million in 2001. The total includes costs of seismic programs; exploratory, delineation and field development drilling, and well abandonments. This is major increase over the previous year's total of \$66.1 million. Sixty percent of expenditures in 2001 reflect the resumption of seismic exploration in the Mackenzie Delta and Beaufort Sea. If expenditures in this region are ignored, expenditures in the central Mackenzie Valley and southern NWT were \$98 million.

Environmental Considerations

Consultations

Before issuing calls for nominations, consultations are held with northern Aboriginal groups to identify areas of environmental sensitivity, including ones holding special interest for cultural or spiritual reasons. Environmental considerations also play an important role when issuing land use permits, water licences and all work authorizations. DIAND also consults with other federal departments and territorial government agencies. The terms and conditions of the calls for nominations and bids reflect the results of this consultation process.

Regulatory Road Map

A regulatory guide for the Inuvialuit Settlement Region (Mackenzie Delta), which outlines the framework for authorizing oil and gas exploration and production activities was produced in June 2001. This document builds upon a similar regulatory roadmap for the southern Mackenzie Valley, which was released in October 2000. Similar regulatory roadmaps will be available in the future for the Gwich'in, Sahtu and the Beaufort Sea offshore.

Environmental Studies Research Fund (ESRF)

Under the *Canada Petroleum Resources Act*, the ESRF finances environmental and social studies related to the exploration and development of oil and gas resources on frontier lands. The program is funded through levies paid by interest holders.

Responding to the resurgence of oil and gas activity in the north and anticipating a need for new research, the ESRF Management Board established a study program for 2001 funded by a levy for the North of approximately 8 cents per hectare. This levy, the first in many years, was agreed to by industry representatives and approved by the Minister.

Specifically related to the north, a research Gap Analysis study (\$105,000) was approved by the ESRF Management Board, which will document past and ongoing research concerning the potential environmental impacts of natural gas exploration, development and gathering lines in the Mackenzie Delta and near-shore Beaufort Sea. As part of that study, a workshop with key stakeholders, which included research scientists, decision makers and other experts in northern natural gas development, was held to review the current state of this knowledge. The study will help determine priority research areas in the north, and will be completed in 2002.

The ESRF is managed by the National Energy Board on behalf of the Minister. Further information may be obtained from the ESRF website at www.esrfunds.org.

Royalties

Royalties from industry on northern oil and natural gas production were \$24.7 million in 2001, up from \$13.4 million in 2000. This increase is due to new gas production from the southern NWT.

The Sahtu and Gwich'in First Nations receive a share of royalties in fulfilment of royalty-sharing provisions in their land claim settlement agreements.

DEVELOPMENT AND PRODUCTION

Central Mackenzie Valley

Norman Wells

(Field Code G001)

The Norman Wells oil field, operated by Imperial Oil Resources, extends beneath the Mackenzie River at 65°20' N latitude. The oil reservoir is a reef of the Devonian Kee Scarp Formation. The field is the starting point of the Norman Wells oil pipeline. Operated by Enbridge Inc., this 300 mm (12") line runs for 866 km south from the Norman Wells field to Zama, Alberta.

Production in 2001 was $1432 \times 10^3 \text{ m}^3$ (9 million barrels) sustaining the production of the previous year. By end 2001, cumulative production from Norman Wells field reached $32.1 \times 10^6 \text{ m}^3$ (202 million barrels).

Four production wells were drilled in the field between July and August 2001. Three of the wells are now on production, the other is an injector. The wells were placed to optimize recovery from part of the field and prolong production. In January 2001 Imperial Oil received approval to proceed with artificial lift conversions on four wells.

Mackenzie Delta

Ikhil

(Field Code G005)

The Ikhil gas field is operated by AltaGas. The field lies in the Mackenzie Delta, 50 km north of Inuvik, NWT. Originally discovered in 1983, the field remained undeveloped until 1999. The reservoir is in the Taglu sands (Reindeer Formation) of Eocene age at a depth

of about 1 100 m. Gas is delivered through a buried 120 mm (6") pipeline to Inuvik where it is used for electricity generation and town supply. Cumulative production since start-up in July 1999 is $27.5 \times 10^6 \text{ m}^3$ (1.0 billion cubic feet) of gas. Production in 2001 was $13.2 \times 10^6 \text{ m}^3$ (0.5 billion cubic feet). The field is currently producing from two wells with peak production over the winter months reflecting heightened demand.

Southern Northwest Territories

Pointed Mountain

(Field Code G003)

Gas production from the Pointed Mountain gas field ceased in 2001 after nearly 30 years. The field, operated by BP Canada Energy, produced from the Devonian Nahanni Formation at depths between 3 900 m and 4 200 m. Monthly flow diminished to $1.4 \times 10^6 \text{ m}^3$ (49.4 million cubic feet) by the end of August 2001. Earlier in the year two other wells in the field were abandoned (Pointed Mountain K-45A and A-55) and the field was shut-in October 2001. The field is currently being evaluated in regard to future activity. Gas produced in 2001 totalled $9.095 \times 10^6 \text{ m}^3$ (0.321 billion cubic feet). Total cumulative gas production from the field to the end of September 2001 was $8\,874 \times 10^6 \text{ m}^3$ (315.0 billion cubic feet).

Paramount Fort Liard "F-36"

(Field Code G006)

This field, operated by Paramount Resources, is located 25 km southeast of Fort Liard NWT. Gas is produced from the Mississippian Mattson Formation about 2 000 m below

surface. Twenty-four kilometres of 324 mm (12") pipeline (the "Shiha Pipeline") carries the gas south to a processing plant near Maxhamish Lake, British Columbia. Two wells were producing in 2001: besides the discovery well (F-36) a second well (O-35) was brought on-stream in April sustaining production levels. Production in 2001 totalled $71.8 \times 10^6 \text{ m}^3$ (2.5 billion cubic feet) and total cumulative production is $138.1 \times 10^6 \text{ m}^3$ (4.9 billion cubic feet).

Chevron Fort Liard "K-29" (Field Code G007)

The Chevron operated Liard field is located on the Liard Anticline in the foothills northwest of Fort Liard NWT and west of the Liard River. The gas reservoir is the Devonian Nahanni Formation in a foothills structure about 3 000 m below surface. The gas is slightly sour. Gas flows through a 46 km pipeline to BP Canada Energy's Pointed Mountain facility where it joins the current northern terminus of the Westcoast pipeline system. A water disposal line connects the field to the Mackay Lake O-80 well, drilled in 1999, which was converted for water disposal. The field is now producing from three wells K-29, M-25 and F-25A. Purcell Energy's Liard F-25A well was worked over, completed and commenced production in June 2001. Total field production in 2001 was $1\,213.6 \times 10^6 \text{ m}^3$ (43.0 billion cubic feet) and cumulative field production to the end of 2001 is $1703.7 \times 10^6 \text{ m}^3$ (60.1 billion cubic feet).

Canadian Natural Resources Limited Fort Liard "P-66A" (Field Code G008)

The gas field lies in the foothills west of the Liard River and 15 km north of the Chevron Liard K-29 well. Originally discovered by

Ranger Oil, the field is now operated by Canadian Natural Resources Ltd. The gas is in the Devonian Nahanni Formation at depths of 3 000 m and is slightly sour. Production began from P-66A in May 2000. The gas produced flows through a pipeline link to a point near the Liard K-29 well where the gas streams commingle. Production in 2001 totalled $1.8 \times 10^6 \text{ m}^3$ (0.06 billion cubic feet) before being shut-in March due to well problems. Cumulative total field production is $61.9 \times 10^6 \text{ m}^3$ (21.9 billion cubic feet).

New Fields on Production in 2001

Paramount Southeast Fort Liard "N-01" (Field Code G009)

Paramount Resources, Berkely Petroleum and Canadian Forest Oil received Development Plan approval for their N-01 gas pool from the National Energy Board on August 1, 2001, subject to consent from the Governor in Council with respect to Part I of the Plan. The Order in Council granting consent was issued on August 15, 2001. Commercial gas production from this single well gas field commenced in August directly into the "Shiha Pipeline" which passes adjacent to the well en route to the Maxhamish gas processing facility.

Cumulative production from the N-01 well August through December 2001 was $33.2 \times 10^6 \text{ m}^3$ (1.2 billion cubic feet).

Paramount Cameron Hills Field Development

The Cameron Hills discoveries resulted from a phase of exploratory drilling in the late 1980s and early 1990s but development was not pursued at the time. The field is located in the southern NWT just north of 60° and west of the Mackenzie Highway.

Paramount Resources filed an amended development plan for gas and oil production from the Cameron Hills on behalf of themselves and Marathon Canada in November 2000. This plan envisages a multi-well development feeding gas into a future pipeline to run south to the Bistcho Lake area of northern Alberta.

At year end 2001, the National Energy Board decision whether to approve the amended plan was awaiting conclusion of the environmental assessment by the Mackenzie Valley Environmental Impact Review Board.

Oil and Gas Production						
	1996	1997	1998	1999	2000	2001
Oil Production (thousands of m³)						
Norman Wells (G001)	1631.8	1584.6	1561.7	1549.1	1434.3	1432.2
Gas Production (millions of m³)						
Norman Wells ^{1*} (G001)	132.4	135.5	132.8	126.5	125.6	130.2
Pointed Mountain (G003)	47.2	33.9	25.2	21.0	17.1	9.1
Ikhil (G005)	-	-	-	3.3	10.0	13.2
Paramount Fort Liard (G006 - "F-36")	-	-	-	-	66.3	71.8
Chevron Fort Liard (G007 - "K-29")	-	-	-	-	490.1	1213.6
Ranger Fort Liard (G008 - "P-66A")	-	-	-	-	60.1	1.8
Paramount Southeast Fort Liard (G009-"N-01")	-	-	-	-	-	33.2

^{1*} Note: Field code "G00X" assigned by the National Energy Board

Oil and Gas Revenues Received (\$)						
	1996	1997	1998	1999	2000	2001
Royalty	13,967,952	9,887,982	6,967,456	7,138,169	13,433,264	24,656,709
Rentals	7,525	7,818	7,818	3,245	2,800	993
Issuance/Registration Fees	14,907	22,464	2,052	16,766	51,589	12,733
Work Deposit Forfeitures	649,000	0	0	289,874	1,342,385	0
Total	14,639,384	9,918,264	6,977,326	7,448,054	14,830,038	24,670,435

Discovered Resource Inventory		
	Crude Oil (millions of m ³)	Natural Gas (billions of m ³)
Mainland Territories*	39	28**
Mackenzie Delta and Beaufort Sea	161	255
Arctic Islands and offshore Eastern Nunavut	65	416
Total	265	699

(Sources: National Energy Board, 1999; DIAND)

* includes Yukon

** resource numbers not adjusted for recent discoveries

STATISTICAL OVERVIEW

Land Status					
	1997	1998	1999	2000	2001
Number of Licences Issued					
Mainland Territories	7	0	0	12	7
Mackenzie Delta & Beaufort Sea	2	5	5	9	0
Arctic Islands & Eastern Arctic Offshore	0	0	0	0	0
Total	9	5	5	21	7
Number of Licences Active					
Mainland Territories	81	73	68	77	84
Mackenzie Delta & Beaufort Sea	70	70	75	84	84
Arctic Islands & Eastern Arctic Offshore	23	23	23	23	23
Total	174	166	166	184	191
Lands Issued in Licences (in millions of hectares)					
Mainland Territories	0.6	0	0	0.8	0.4
Mackenzie Delta & Beaufort Sea	0.2	0.1 [*]	0.31	0.7	0
Arctic Islands & Eastern Arctic Offshore	0	0	0	0	0
Total	0.8	0	0.31	1.5	0.4
Lands Relinquished or Surrendered (in millions of ha)					
Mainland Territories	0	0.1 ²	0.4	0.2	0
Mackenzie Delta & Beaufort Sea	0	0	0	0	0
Arctic Islands & Eastern Arctic Offshore	0	0	0	0	0
Total	0	0.1²	0.4	0.2	0
Lands Held Under Licence (in millions of ha)					
Mainland Territories	1.6	1.6	1.4	2.2	2.6
Mackenzie Delta & Beaufort Sea	1.1	1.1	1.3	1.8	1.8
Arctic Islands & Eastern Arctic Offshore	1.3	1.3	1.2	1.2	1.2
Total	4	4	3.9	5.2	5.6

¹Less than 0.1 million hectares.

² Adjustment to Mainland Territories by deletion of eight licences totalling 25,529 hectares in Yukon.

Exploration Licences						
No.	Area (in ha)	Representative*	Dates (y.m.d.) Issue	Well to be Drilled by	Expiry	Work Bid \$
Eastern Arctic Offshore						
EL 297	931,640	CanNat Resources Inc.	1998.07.14	2008.07.14	2008.07.14	
Beaufort Sea/Mackenzie Delta						
EL317	175,810	Talisman Energy Inc.	1986.10.05	n/a		n/a
EL329	349,982	BP Canada Energy Resources	1987.09.05	n/a		n/a
EL384	85,761	AEC West Ltd.	1997.01.06	2006.01.05	2006.01.05	
EL385	128,327	AEC West Ltd.	1997.01.06	2006.01.05	2006.01.05	
EL393	72,474	Burlington Resources Canada	1999.09.18	2004.09.17	2008.09.17	35,550,000.00
EL394	73,155	Burlington Resources Canada	1999.09.18	2004.09.17	2008.09.17	42,375,000.00
EL395	72,311	Petro-Canada	1999.09.18	2004.09.17	✓ 2008.09.17	51,848,860.00
EL396	75,511	Petro-Canada	1999.09.18	2004.09.17	2008.09.17	53,444,900.00
EL403	75,650	Shell Canada	2000.08.15	2005.08.14	2009.08.14	35,000,000.00
EL404	73,608	BP Canada Energy	2000.08.15	2005.08.14	2009.08.14	76,675,288.00
EL405	76,307	Petro-Canada	2000.08.15	2005.08.14	2009.08.14	46,454,620.66
EL406	72,523	Petro-Canada	2000.08.15	2005.08.14	2009.08.14	81,876,595.84
EL407	71,515	Anadarko Canada Corp.	2000.08.15	2005.08.14	2009.08.14	2,421,350.84
EL408	93,944	Devon ARL Corp.	2000.08.15	2005.08.14	2009.08.14	77,550,668.80
EL409	80,104	Devon ARL Corp.	2000.08.15	2005.08.14	2009.08.14	56,988,788.96
EL410	95,073	Devon ARL Corp.	2000.08.15	2005.08.14	2009.08.14	21,654,432.96
EL411	69,348	Devon ARL Corp.	2000.08.15	2005.08.14	2009.08.14	67,875,764.64
Mainland - Southern NWT						
EL363	6,064	Canadian Forest Oil	1995.01.23	1999.01.22	✓ 2002.01.22	3,529,000.00
EL365	20,635	Canadian Forest Oil	1995.01.23	1999.01.22	✓ 2002.01.22	1,500,000.00
EL367	24,382	Paramount Resources	1995.01.23	1999.01.22	✓ 2002.01.22	1,768,600.00
EL368	23,085	Paramount Resources	1995.01.23	1999.01.22	✓ 2002.01.22	2,800,000.00
EL369	25,737	Paramount Resources	1995.01.23	1999.01.22	✓ 2002.01.22	8,765,580.00
EL380	25,606	Canadian Forest Oil	1996.04.10	2000.04.09	✓ 2003.04.09	2,200,000.00
EL381	21,236	Paramount Resources	1996.04.10	2000.04.09	✓ 2003.04.09	6,250,000.00
EL382	25,335	Paramount Resources	1996.04.10	2000.04.09	✓ 2003.04.09	1,100,000.00
EL383	25,515	Paramount Resources	1996.04.10	2000.04.09	✓ 2003.04.09	1,224,400.00

Exploration Licences							
No.	Area (in ha)	Representative^x	Dates (y.m.d.) Issue	Well to be Drilled by	Expiry	Work Bid \$	
Mainland - Central Mackenzie Valley							
EL372	88,693	Canadian Forest Oil	1995.05.18	1999.05.17	✓	2003.05.17	3,215,000.00
EL373	99,560	Devlan Exploration	1996.03.27	2001.03.26	✓	2005.03.26	1,226,000.00
EL374	138,170	Devlan Exploration	1996.03.27	2001.03.26	✓	2005.03.26	1,042,000.00
EL375	3,508	Murphy Oil Company	1996.03.27	2000.03.26	✓	2004.03.26	2,806,000.00
EL386	114,737	Devlan Exploration	1997.05.05	2001.05.04	✓	2005.05.04	1,072,000.00
EL387	128,575	AEC West Ltd.	1997.05.05	2001.05.04	✓	2005.05.04	9,482,688.00
EL388	30,696	Murphy Oil Company	1997.05.05	2001.05.04	✓	2005.05.04	2,831,080.00
EL389	46,738	Canadian Abraxas	1997.05.05	2001.05.04	✓	2005.05.04	3,101,015.00
EL390	50,938	Canadian Forest Oil	1997.05.05	2001.05.04	✓	2005.05.04	6,200,000.00
EL391	71,816	Northrock Resources	1997.05.05	2001.05.04	✓	2005.05.04	4,000,000.00
EL392	133,518	AEC West Ltd.	1997.05.05	2001.05.04	✓	2005.05.04	8,466,460.00
EL397	134,565	Northrock Resources Ltd.	2000.08.01	2004.07.31		2008.07.31	16,580,000.00
EL398	133,480	AEC West Ltd.	2000.08.01	2004.07.31		2008.07.31	1,000,000.00
EL399	120,496	Paramount Resources	2000.08.01	2004.07.31		2008.07.31	8,400,000.00
EL400	118,060	Canadian Natural Resources Limited	2000.08.01	2004.07.31		2008.07.31	17,500,000.00
EL401	128,584	EOG Resources Canada Inc.	2000.08.01	2004.07.31		2008.07.31	12,750,000.00
EL402	128,718	Devon ARL Corp.	2000.08.01	2004.07.31		2008.07.31	1,243,789.00
EL412	68,772	Canadian Forest Oil	2001.09.18	2005.09.17		2009.09.17	1,867,911.00
EL413	80,464	Devlan Exploration	2001.09.18	2005.09.17		2009.09.17	2,000,000.00
EL414	84,880	Paramount Resources	2001.09.18	2005.09.17		2009.09.17	10,750,000.00
EL415	83,216	Hunt Oil	2001.09.18	2005.09.17		2009.09.17	1,260,000.00
EL416	80,510	Northrock Resources Ltd.	2001.09.18	2005.09.17		2009.09.17	1,526,430.00

x These representatives are current to date of draft i.e. March 2002

^{1*} Amended per s. 26 (4) of the CPRA, originally issued pursuant to the Canada Oil and Gas Land Regulations.

^{2*} Under work prohibition orders.

^{3*} Land exchange for Cape Bathurst former permits.

✓ Well requirement met as of year end. The drilling of one exploratory or delineation well prior to the end of Period 1 of the term is a condition precedent to obtaining tenure to Period 2.

2001 DRILLING STATISTICS

OPERATOR	WELL NAME	LAT	LONG	CLASS ¹	TD (m)	SPUD DATE	RR DATE	STATUS ²	RIG	LICENCE ³	Depth
											drilled in
											2001 (m)
Southern Territories											
Canadian											
Forest Oil	CDN Forest et al North Liard C-31A	60.50009	-123.61004	EX	2942	1/6/01	4/4/01	P&S	Akita #58E	EL363	2942
Paramount	Paramount Anadarko Bovie J-76	60.26233	-122.98319	EX	3353	12/22/01	2/10/02		Akita #58	EL369	2539
Paramount	Paramount et al North Liard N-01	60.01454	-123.26625	EX	1940	12/12/00	1/16/01	GAS	Precision #379	EL381	199
Central Mackenzie Valley											
Devlan											
Exploration	Devlan et al Ontaratue D-39	67.12639	-131.64944	EX	1250	3/19/01	4/5/01	SUSP	Akita Drilling	EL374	1250
Devlan											
Exploration	Devlan et al Thunder River N-73	67.40750	-131.46444	EX	1146	2/24/01	3/15/01	P&S	Akita Drilling	EL373	1142
Devlan											
Exploration	Devlan et al Tree River B-10	67.32056	-131.75833	EX	1294	1/28/01	2/20/01	P&S	Akita Drilling	EL386	1290
Imperial	Well(O-19X)			DV	763	7/20/01	7/27/01	PROD	Akita #51	PAA	763
Imperial	Well(m-19X)			DV	711	7/28/01	7/27/01	PROD	Akita #51	PAA	711
Imperial	Well(N-18X)			DV	638	8/5/01	8/3/01	PROD	Akita #51	PAA	638
Imperial	Well(O-16X)			DV	756	7/12/01	7/9/01	INJ	Akita #51	PAA	756
Mackenzie Delta											
Devon ARL	Devon PC Tuk M-18	69.29739	-133.07628	EX	2962	12/24/01	2/4/02		Akita #63E	IN	2759
Japex	Japex/JNOC/GSC Mallik 3L-38	69.46064	-134.66156	Other	1188	12/25/01	1/8/02	SUSP	Akita #15	EL393	454
PetroCanada	PC Anderson Kurk M-15	69.07682	-135.33302	EX	3093	2/10/01	4/17/01	P&S	Akita #60	EL395	3093
Aurora											
College	Aurora Training Well, Inuvik G-53	68.39053	-133.76172	Other	401	7/29/01	8/4/01	SUSP	Akita/Eqtak #15		401

¹ Class EX=exploratory, DL=delineation, DV=development

² Status P&S=plugged and suspended, PROD=production, INJ-injection

³ Licence EL=Exploration Licence, SDL=Significant Discovery Licence, PL=Production Licence, PAA=Proven Area Agreement-Norman Wells, IN=Inuvialuit Lands

FURTHER INFORMATION

Northern Oil and Gas Directorate

Please check our website first! www.ainc-inac.gc.ca/oil

Many sources of information on oil and gas, environmental and land use matters originate with the Department of Indian Affairs and Northern Development. To obtain specific information, please include the appropriate contact listed in the sources below with the general mailing address for the department.

Northern Oil and Gas Directorate
Department of Indian Affairs and Northern Development
OTTAWA ON K1A 0H4 Canada

Information on the resource management regime, calls for nominations and bids and other related information: Rights Issuance and Policy - Telephone: (819) 953-8529.

Information on registration procedures and regulations, exploration, significant discovery and production licences, transfers, notices and maps: Rights Administrator/Registrar
Telephone: (819) 953-8490.

Information on northern exploration history and geological/geophysical activities: Senior Petroleum Geologist - Telephone: (819) 953-8722.

Information on Benefits Plan requirements associated with new exploration programs on land in the Northwest Territories is available from the department's Northwest Territories Regional office - Telephone: (867) 669-2618; and for Nunavut and northern offshore the information is available from the Northern Oil and Gas Directorate - Telephone: (819) 994-1606.

Information on royalty matters and royalty submissions: Manager, Fiscal Policy and Royalty Administration - Telephone: (819) 953-9488.

Northern Oil and Gas Directorate
Department of Indian Affairs and Northern Development
6th Floor, 10 Wellington Street
Hull QC K1A 0H4
Telephone: (819) 997-0877
Fax: (819) 953-5828
Internet: <http://www.ainc-inac.gc.ca/oil>

Oil and Gas Division
Northwest Territories Regional Office
Department of Indian Affairs and Northern Development
4914-50th Street, P.O. Box 1500,
Yellowknife, NWT X1A 2R3
Telephone: (867) 669 2618
Fax: (867) 669-2409

Other Sources of Information

Through the offices of the National Energy Board at the address below, information on the following is available:

- The Regulatory Support Office has information on exploration, development, production, pipeline transportation and export;
- The Frontier Information Office provides access to maps, technical information, geological and geophysical reports, well history reports and records; and
- The Environmental Directorate provides the Secretariat for the Environmental Studies Research Funds Management Board.

National Energy Board (NEB)
444 Seventh Avenue SW
Calgary AB T2P 0X8
Telephone: (403) 292-4800
Fax: (403) 292-5503

The Geological Survey of Canada's Institute of Sedimentary and Petroleum Geology, provides public viewing and sampling facilities for cores and samples, and information on wells drilled North of 60° at its offices at:

Institute of Sedimentary and Petroleum Geology
3303-33rd Street NW
Calgary AB T2L 2A7
Telephone: (403) 292-7000
Fax: (403) 292-5377

Information on wells drilled in the Baffin Bay – Davis Strait region is available from:

Core Storage and Laboratory
Geological Survey of Canada Atlantic
Bedford Institute of Oceanography
P.O. Box 1006
Dartmouth NS B2Y 4A2
Telephone: (902) 426-6127
Fax: (902) 426-4465
Email: hardy@agc.bio.ns.ca