

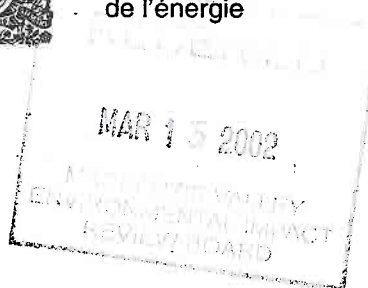
National Energy
Board



Office national
de l'énergie

File 2620-D-4-7.
9 January 2002

Mr. Lloyd Doyle, Area Manager NW Alberta
Paramount Resources Ltd.
4700 Bankers Hall West
888 - 3rd Street SW
Calgary, Alberta
T2P 5C5
Facsimile (403) 266-6032



Dear Mr. Doyle:

**Paramount Resources Ltd. Application dated 21 November 2000 for an
Amendment to the Cameron Hills Development Plan pursuant to
subsection 5.1(5) of the *Canada Oil and Gas Operations Act* (COGOA)**

The National Energy Board (the Board) has considered the application dated 21 November 2000 for an Amendment to the Development Plan submitted by Paramount Resources Ltd. on behalf of itself and of its partner, Marathon Canada Limited, (collectively Paramount). The Board has issued the attached Reasons for Decision and Order DP-01-2002, the effect of which is to grant an approval pursuant to paragraph 5.1(5) of the COGOA, subject to and only effective upon the consent of the Governor in Council in relation to Part I of the Amendment to the Development Plan. The effect of this approval is to permit Paramount to proceed with further applications for the necessary authorizations under paragraph 5(1)(b) of the COGOA for works or activities related to the development of the oil and gas pools in the Cameron Hills field as contemplated by the Amendment to the Development Plan.

Yours truly,

Michel L. Mantha
Secretary

Attachments (2)

c.c. Ms. M. Fortier, Indian and Northern Affairs Canada, facsimile (819) 953-5828
Mr. David Livingstone, INAC, Yellowknife, facsimile (867) 669-2707
Mr. Alan S. Hollingworth, Q.C., Gowling Lafleur Hendersen LLP, facsimile (403) 263-9193

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Reasons for Decision

Paramount Resources Ltd.

**Application dated 21 November 2000 for an
Amendment to the Cameron Hills Development Plan**

1.0 Introduction

Paramount Resources Ltd. on behalf of itself and its partner, Marathon Canada Limited, (collectively Paramount) submitted an application dated 21 November 2000 to the National Energy Board (the Board) for approval pursuant to subsection 5.1(5) of the *Canada Oil and Gas Operations Act* (COGOA) for an Amendment to the Development Plan for the Cameron Hills field in the Northwest Territories (NWT).

Subsection 5.1(3) of the COGOA requires that a Development Plan be set out in two Parts:

- (a) in Part I, a description of the general approach of developing the pool or field, and in particular, information, in such detail as may be prescribed, with respect to
 - (i) the scope, purpose, location, timing and nature of the proposed development,
 - (ii) the production rate, evaluations of the pool or field, estimated amounts of oil or gas proposed to be recovered, reserves, recovery methods, production monitoring procedures, costs and environmental factors in connection with the proposed development, and
 - (iii) the production system and any alternative production systems that could be used for the development of the pool or field; and
- (b) in Part II, all technical or other information and proposals, as may be prescribed, necessary for a comprehensive review and evaluation of the proposed development.

Further requirements are prescribed in the COGOA *Canada Oil and Gas Production and Conservation Regulations*.

An approval of an Amendment of the Development Plan would not provide the developer with an authorization to undertake any work or activity contemplated in the amendment. In order for any specific works or activities to proceed, authorizations from the Board pursuant to paragraph 5(1)(b) of the COGOA¹ to construct and operate the amended portion of the development are required. At that time, further site-specific details would be considered in order to evaluate these applications.

The Board has reviewed the Amendment of the Development Plan and is satisfied that it meets the filing requirements set out in the legislation.

¹ Subsection 5.1(1) of the COGOA states, "No approval that is applicable to an authorization under paragraph 5(1)(b) to carry out work or activity in relation to developing of a pool or field, shall be granted unless the National Energy Board.... has approved a development plan relating to the pool or field..."

2.0 Project Overview

Drilling began in the Cameron Hills area in 1957. Paramount discovered a number of oil and gas pools in the late 1980s and early 1990s. The original development plan application for Cameron Hills, dated 18 October 1991, was for development of the oil pools. That application was approved on 16 January 1992 by the Minister of Indian Affairs and Northern Development. In its Amendment of the Development Plan, Paramount is proposing to develop the gas pools in the Cameron Hills field in addition to the oil pools.

Paramount is proposing delineation/development well testing and drilling to confirm oil and gas reserves. After which, Paramount is proposing to construct an oil and gas gathering system, wellsite facilities, a central battery, a water disposal system and a multi-phase trans-border pipeline to a terminal in northern Alberta. In addition, Paramount has proposed to conduct an one year production pilot scheme project for an oil pool prior to proceeding to full-scale production.

3.0 Location

The Cameron Hills field is located in the southern NWT approximately 53 kilometres southeast of the community of Kakisa, NWT and immediately north of the Alberta-NWT border. The Cameron Hills field is in grid areas: 60° 10' N 117° 15' W; 60° 10' N 117° 30' W; and 60° 20' N 117° 30' W.

4.0 Timing

Paramount is proposing to: drill delineation/development wells; to construct facilities, gathering lines and a trans-border multi-phase pipeline during the 2001/2002 winter season; and to begin production in April 2002. Paramount will require further authorizations under paragraph 5(1)(b) of the COGOA for further works and activities contemplated by the Development Plan, as amended.

5.0 Geology

The Cameron Hills area sits on a Precambrian high located on the southern flank of the Tathlina High dipping west-southwest. Reactivated Precambrian fault-play traps hydrocarbons in formations of the Middle Devonian. Other major faults trend northeast-southwest. The northeastward faults are parallel to the Great Slave Lake Shear Zone which lies to the southeast of Cameron Hills. Faulting has resulted in hydrocarbons trapped in separate pools and pressure systems.

6.0 Reserve Estimates and Production Forecast

Paramount has estimated total recoverable sales gas reserves to be in excess of $2.8 \times 10^9 \text{ m}^3$ (100 Bcf) and has estimated initial deliverability from these reserves to be in the range of $570\text{-}700 \times 10^3 \text{ m}^3/\text{d}$ (20-25 MMcfd). Paramount has estimated recoverable oil reserves to be in excess of $5\,000 \times 10^3 \text{ m}^3$ (30 MM bbls) and has estimated an initial oil production to be about 160 m^3 per day (1,000 bbl/d). In addition, Paramount has proposed a delineation drilling program to verify reserves and facility design. The Board considers the estimates of reserves and the estimates of initial production by Paramount to be reasonable.

7.0 Drilling

Paramount proposes that it may tie-in a number of future well locations which may include: A-04, A-46, B-05, C-74, D-74, G-03, H-04, I-73 and M-73(2). A horizontal well is also proposed. These potential well location would help to further determine the extent of the field. The drilling of any future wells would be in accordance with the COGOA *Canada Oil and Gas Drilling Regulations*.

8.0 Production Facilities and Production System Design

Paramount is proposing to construct a well effluent gathering system to the oil and gas wells. The slightly sour raw gas, hydrocarbon liquids and water produced from the wells would be routed into the gathering system which would transport the well effluent to the central battery.

The central battery would handle gas well and oil well effluent. Paramount has proposed that the central battery would include the following: a free water knockout; oil well group and test separators; water disposal pumps; oil pumps; storage tanks; a skimmer tank; a natural gas-driven electrical power generation system; gas compressors; a gas separator; a treater; a glycol gas dehydrator facility; a flare knockout drum and stack; an utility air system; an emergency shutdown system; and a communication system. Paramount has proposed a design capacity for the central battery of 160 m³/d (1,000 Bbls/d) for liquid hydrocarbons, 215 m³/d (1,350 Bbls/d) for water and 700 10³m³/d (25 MMcf/d) for gas. In addition, Paramount has proposed living accommodations for on-site operating personnel, a machine shop and warehouse complex, and an airstrip.

Paramount has proposed that separated gas and hydrocarbon liquids exiting the central battery be combined and transported via a 15 kilometre multi-phase trans-border pipeline connecting to an Alberta multi-phase gathering system located at 5-24-126-22W5M. The proposed trans-border pipeline would have a 324 mm (12 inch) nominal pipe size and would initially be designed with a capacity of 700 10³m³/d (25 MMcf/d) for gas and 160 m³/d (1,000 Bbls/d) for liquid hydrocarbons.

Paramount has proposed to construct a sweet gas line from an Alberta gas plant to the central battery. The sweet gas line would provide fuel gas for the central battery and the electrical power generators.

Paramount has proposed a produced water disposal system which would consist of an internally lined pipeline from the central battery to a proposed water disposal well L-44 or an as yet undetermined well in Cameron Hills.

The Board considers the proposed production facilities and production system design to be reasonable.

9.0 Alternative Production Systems

The production system proposed in the original development plan was a system designed to only transport oil to market and did not include facilities to transport gas production to market. The original proposal included the construction of an all-weather road and the transportation of oil by tank trucks to an Alberta facility. The current proposal includes the construction of gas handling facilities and a multi-phase trans-border pipeline permits transportation of both oil and gas production to market. An all-weather road is not part of the current proposal.

In addition, Paramount has proposed to conduct an one year pilot project production scheme on an oil pool to further assess and evaluate the pool for the potential of primary production or other production systems including enhanced recovery schemes (such as gas cycling) for its application to full-scale production.

10.0 Production Monitoring

Paramount has proposed the following wellsite production monitoring:

- the wellsite facilities will be designed for unattended operating mode;
- each producing gas well and remote oil well will be monitored utilizing telemetry which will relay wellsite equipment status, flow rate, temperature and pressure to the continually attended central battery;
- oil wells near the central battery will be monitored through visits to the wellsites every second day or more often if necessary;
- operating personnel will regularly check and maintain equipment at each wellsite; and
- the gathering system pipeline pressures will be monitored continuously which will detect leaks or blockages and initiate emergency shutdown procedures.

Paramount has proposed the following monitoring at the central battery:

- the facility will be continually attended by a minimum of two operators;
- the fully automated programmable logic control system will be designed for an unattended operating mode;
- the control system will initiate corrective/preventative procedures and will notify operating personnel if unusual operating or emergency conditions are detected;
- power will be supplied by two onsite natural gas driven power generators (one will serve as the emergency standby unit); and,
- production volumes of each flow stream entering and exiting the facility will be measured and recorded on a continuous basis.

The Board considers the proposed production monitoring procedures to be reasonable.

11.0 Costs

Paramount has estimated capital costs of \$22,525,000 for the proposed development. The estimate includes the cost of land right-of-way, equipment, installation, engineering, environmental and other related expenditures. The annual operating costs for the development have been estimated by Paramount as approximately \$2,000,000. The costs for processing the slightly sour gas at an Alberta facility have been estimated to range from \$0.30 to \$0.80/Mcf. The Board considers the cost estimates to be reasonable.

12.0 Public Consultation / Environmental Impact

Paramount developed and carried out an ongoing public information and consultation program for the Amendment of the Development Plan, beginning in May 2000. Paramount has submitted results of its public information program showing that the development was discussed with the public, First Nations, and regulatory representatives in Enterprise, Kakisa, Hay River, Hay River Reserve, Fort Providence, Dene Tha', Trout Lake, West Point, Calgary, Yellowknife, and Ottawa. Further, a traditional knowledge study was undertaken by Paramount.

Part I of the development plan requires that the developer provide a description of the general approach of developing the field including environmental factors. Paramount has submitted an Environmental Impact Assessment Report (EIA Report²) dated September 2000 which was prepared by Western Oilfield Environmental Services Ltd. and Golder Associates Ltd. (WOES et al).

In its EIA Report, Paramount identified potential biophysical and socio-economic issues and provided mitigative measures associated with the construction and operation of the gathering lines and production and ancillary facilities by applying information and observations from published literature, field investigations, specialist knowledge, and recent environmental assessments, in particular from the following sources:

- Paramount's public information and consultation program;
- recent environmental assessments from the region³;
- published literature on impact sources and effects;
- the environmental assessment⁴ supplied with the original oil field development plan;
- WOES et al project team knowledge of the environment and the interaction with project components and the potential effects; and
- field investigations during the planning stage of the project.

Pursuant to subsection 126(3) of the *Mackenzie Valley Resources Management Act* (MVRMA) an environmental assessment of the Paramount Cameron Hills Gathering System and Pipeline Development (the Development Proposal) was conducted by the Mackenzie Valley Environmental Impact Review Board (MVEIRB). On 3 December 2001, the MVEIRB issued the *Report of Environmental Assessment on the Paramount Resources Ltd. Cameron Hills Gathering System and Pipeline Development* (the Report) pursuant to subsection 128(2) of the MVRMA. The Report includes within its scope the Paramount application submitted under subsection 5.1(5) of the COGOA for approval of an Amendment to Development Plan.

Having considered all of the evidence before it, the MVEIRB decided, according to subparagraph 128(1)(b)(ii) of the MVRMA, to recommend that the Development Proposal be approved subject to the imposition of measures it considered necessary to prevent significant adverse impact on the social, cultural and economic environment. The Board, as a designated regulatory agency, participated in a consultation process with the MVEIRB on the Report pursuant to subsection 131(1) of the MVRMA on 4 January 2002 in Yellowknife. Indian and Northern Affairs Canada, the Department of Fisheries and Oceans, the Government of Northwest Territories Department of Resources Wildlife and Economic

²The EIA Report meets the requirement of item 3 of Appendix A of the 1992 Development Plan detailing the terms and conditions of approval of the 1992 Development Plan.

³Recent environmental assessments include:

ARC Inc., 1998. Environmental Assessment Cameron Hills Wells I-74 and C-75. Prepared for Paramount Resources Ltd., Calgary, Alberta; and

Golder Associates Ltd., 1999. Preliminary Terrain Hazard Assessment, Cameron Hills Forest Management Area West of Hay River, Northwest Territories. Prepared for Forest Management Division, Resources, Wildlife and Economic Development, Government of the Northwest Territories.

⁴Hardy BBT Limited, 1991. Cameron Hills Oil Development Plan: Environmental Components. Prepared for Paramount Resources Ltd., Calgary, Alberta.

Development, Paramount, and the Ka'a'Gee Tu First Nation were also present at the 4 January 2002 meeting. In accordance with paragraph 131(1)(b) of the MVRMA, after consulting the MVEIRB, the Board, in its letter dated 9 January 2002, adopted the recommendation of the MVEIRB that an approval of the Development Proposal be subject to the imposition of measures modified as per the MVEIRB letter dated 8 January 2002. The Board will, to the extent of the it's authority, carry out the MVEIRB recommendation.

After reviewing the Paramount Amendment to the Development Plan application and the commitments expressed in subsequent submissions by Paramount, the Board is satisfied with the environmental and socio-economic information provided by Paramount related to potential impacts on the environmental and its approach to mitigating potential impacts.

13.0 Decision

Having received confirmation on 5 October 2001 from the Ministry of Indian Affairs and Northern Development that Paramount has satisfactorily met the benefits plan requirements of section 5.2 of the COGOA, the Board has completed its assessment of the Paramount application.

The Board accepts the information provided by Paramount and is satisfied that the proposed amended plan to develop the Cameron Hills oil and gas field is reasonable. In this light, the Board finds, among other things, the reserves estimates, the proposed production facilities and production system design, and production monitoring procedures to be reasonable.

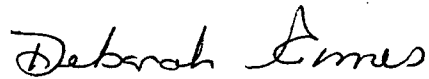
The Board has considered the Paramount application and has decided to approve the Amendment to the Development Plan, subject to and only effective upon the consent of the Governor in Council in relation to Part I of the Amendment to the Development Plan, and subject to the conditions set out below. The effect of this decision is to allow Paramount to seek further authorizations that would relate to the various works and activities contemplated by the Amendment to the Development Plan.

Conditions:

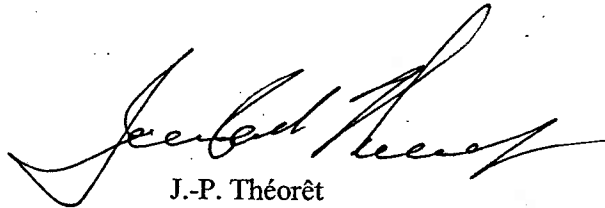
- (1) The pilot scheme for the oil pool shall be for a period of one year starting from the first day of production and Paramount shall submit to the Board pursuant to section 87 of the *Canada Oil and Gas Production and Conservation Regulations*:
 - (i) an interim evaluation of the pilot scheme after six months and is to include information on porosity, pore saturation, structure, permeability, pay thickness, reservoir pressure, production volumes, rate history and the results of any core analysis studies, relative permeability studies, production/extended flow test analyses and PVT studies, and,
 - (ii) within six months upon completion of the pilot scheme, a report on the results of the pilot scheme including supporting data, analyses, reservoir modeling and simulations and the conclusions in respect of the potential of the scheme for its application to full-scale production; and,
- (2) Paramount shall ensure that the policies, practices, recommendations and procedures to mitigate impacts on the environment proposed for any work or activity contemplated by the Amendment to the Development Plan, conforms with the approach to environmental protection identified in the Amendment to the Development Plan and the commitments expressed in subsequent submissions by Paramount.

Disposition

The foregoing constitutes our Reasons for Decision in the matter.



D. Emes
Presiding Member



J.-P. Théorêt
Member



C. Dybwad
Member

Calgary, Alberta
9 January 2002



ORDER DP-01-2002

**Paramount Resources Ltd. Application dated 21 November 2000
for an Amendment to the Cameron Hills Development Plan**

IN THE MATTER OF the *Canada Oil and Gas Operations Act* (COGOA) and the regulations made thereunder; and

IN THE MATTER OF an application pursuant to subsection 5.1(5) of the COGOA, by Paramount Resources Ltd. on behalf of itself and of its partner, Marathon Canada Limited, (collectively Paramount) filed with the National Energy Board (the Board) under File 2620-D-4-7.

BEFORE the Board on 9 January 2002.

WHEREAS a Development Plan application dated 18 October 1991 for development of oil pools in the Cameron Hills field was approved by the Minister of Indian Affairs and Northern Development on 16 January 1992;

AND WHEREAS the Board has received an application for Amendment to the Development Plan dated 21 November 2000 submitted by Paramount to develop the gas pools in the Cameron Hills field in addition to the oil pools;

AND WHEREAS the application for an Amendment to the Development Plan provides a description of the general approach of developing oil and gas in the Cameron Hills field with supporting technical information;

AND WHEREAS an approval of an Amendment to the Development Plan pursuant to subsection 5.1(5) is required before any authorizations for work or activity in relation to the Amendment to the Development Plan may be granted;

AND WHEREAS pursuant to subsection 126(3) of the *Mackenzie Valley Resource Management Act* (MVRMA) an environmental assessment of the Paramount Cameron Hills Gathering System and Pipeline Development (the Development Proposal) was conducted by the Mackenzie Valley Environmental Impact Review Board (MVEIRB) and on 3 December 2001 pursuant to subsection 128(2) of the MVRMA issued the *Report of Environmental Assessment on the Paramount Resources Ltd. Cameron Hills Gathering System and Pipeline Development* (the Report);

AND WHEREAS the MVEIRB decided, according to subparagraph 128(1)(b)(ii) of the MVRMA, to recommend that the Development Proposal be approved subject to certain measures;

AND WHEREAS in accordance with paragraph 131(1)(b) of the MVRMA, after consulting the MVEIRB, the Board, in its letter dated 9 January 2002 adopted the recommendation of the MVEIRB that approval of the Development Proposal be subject to the imposition of measures modified as per the MVEIRB letter dated 8 January 2002;

AND WHEREAS the Board, as designated regulatory agency under the MVRMA, is obliged, pursuant to subsection 131(2) of that Act, to carry out, to the extent of its authority, any recommendation that it adopts;

AND WHEREAS the Paramount application for approval of an Amendment to Development Plan is included within the scope of the Development Proposal and the MVEIRB Report;

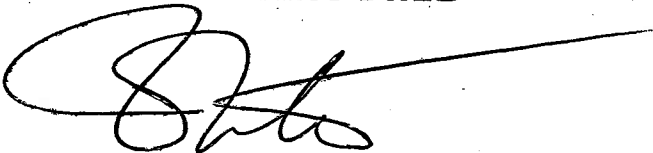
AND WHEREAS on 5 October 2001 the Ministry of Indian and Northern Affairs Canada provided confirmation that Paramount has satisfactorily met the benefits plan requirements of section 5.2 of the COGOA in respect of the Amendment to the Development Plan;

AND WHEREAS the Board has examined the application and considers it appropriate to grant the Paramount request for approval;

IT IS ORDERED, pursuant to subsection 5.1(5) of the COGOA, that the Amendment to the Development Plan is approved, subject to and only effective upon the consent of the Governor in Council in relation to Part I of the amended Development Plan, and subject to the following conditions:

- (1) The pilot scheme for the oil pool will be for a period of one year starting from the first day of production and Paramount shall submit to the Board pursuant to section 87 of the *Canada Oil and Gas Production and Conservation Regulations*:
 - (i) an interim evaluation of the pilot scheme after six months and is to include information on porosity, pore saturation, structure, permeability, pay thickness, reservoir pressure, production volumes, rate history and the results of any core analysis studies, relative permeability studies, production/extended flow test analyses and PVT studies, and,
 - (ii) a report on the results of the pilot scheme within six months upon completion of the pilot scheme and is to include supporting data, analyses, reservoir modeling, simulations and the conclusions in respect of the potential of the scheme for its application to full-scale production; and,
- (2) Paramount shall ensure that the policies, practices, recommendations and procedures to mitigate impacts on the environment proposed for any work or activity contemplated by the Amendment to the Development Plan, conforms with the approach to environmental protection identified in the Amendment to the Development Plan and the commitments expressed in subsequent submissions by Paramount.

NATIONAL ENERGY BOARD



Michel L. Mantha
Secretary