

Mackenzie Valley Environmental Impact Review Board

Report of Environmental Assessment

On the

Paramount Resources Ltd.

Cameron Hills Gathering System and Pipeline Development

Issued: December 3, 2001
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Executive Summary

The Mackenzie Valley Environmental Impact Review Board (Review Board) has been guided by the principles outlined in Sections 114 and 115 of the *Mackenzie Valley Resource Management Act* (MVRMA or Act) throughout this environmental assessment (EA) of the Paramount Resources Ltd. Cameron Hills Gathering System and Pipeline Development. These principles include the need to protect the environment from significant adverse impacts, and to protect the social, cultural and economic well-being of residents and communities in the Mackenzie Valley.

To make its decision, the Review Board has relied upon the information in Paramount's environmental reports, the technical reports provided by reviewers and all of the other information on the Public Registry. Having considered the evidence, the Review Board made its decision according to Section 128 of the Act.

The Review Board has concluded that the proposed development, with the implementation of the Review Board's measures and Paramount's commitments, is not likely in its opinion to have any significant adverse impact on the environment or to be a cause of significant public concern. The Review Board's recommended measures are listed in Attachment 1. Paramount's commitments are listed in Attachment 2. If these measures and commitments are not implemented (or replaced with more stringent mitigative measures), then the Review Board's conclusions about impact significance will be affected.

For the consideration of the affected parties, the Review Board has made suggestions in this Report of Environmental Assessment. These suggestions are listed in Attachment 3.

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December 3, 2001

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1 Introduction

1.1 Development Description

The proposed development is primarily located on the plateau of the Cameron Hills in the Northwest Territories (NWT), about 75 km southwest of Enterprise, NWT and includes pipelines extending approximately 9.9 km south of the NWT/Alberta border. NWT Highway No. 1 is east of the development area.

The development includes the construction and operation of the facilities required to extract oil and natural gas, transport it via a gathering system to a central battery, and then transport it in a trans-boundary pipeline to a connection point with a provincially regulated gathering system pipeline in Alberta. The complete scope of the development is provided in Section 4.1.

1.2 Development Regulatory History

Mackenzie Valley Land and Water Board - Preliminary Screening

On April 20, 2001, the MVLWB received Paramount's applications for a Type 'A' Land Use Permit (Application #MV2000P0055) and a Type 'B' Water License (Application #MV2000L1-0014) required to undertake the Cameron Hills Pipeline and Gathering System Project. The applications covered the construction and operation of a gathering system to transport the oil and gas to a battery and a pipeline system to transport the oil and gas from the gathering system to a connection point with a pipeline in Alberta. The total length of the trans-boundary pipeline would be about 15 km with about 5 km in the Northwest Territories and 10 km in Alberta. The applications to the MVLWB did not cover the approximately 10 km of the pipeline system in Alberta.

The applications and supporting documentation were circulated to federal and territorial government departments, first nations and municipal governments. The comments received were taken into consideration by the MVLWB when it conducted the preliminary screening of the development proposal.

On July 12, 2001, the MVLWB approved the preliminary screening for the Pipeline and Gathering System Project but requested that further study be undertaken pursuant to Section 22(2)(b) of the *Mackenzie Valley Land Use Regulations* (MVLUR). The MVLWB established a Technical Advisory Committee (TAC) to establish the terms and conditions of the land use permit and water license and prepare for the on-going administration of the permit and license. No specific environmental concerns were cited by the MVLWB as a reason for the formation of the TAC.

Mackenzie Valley Environmental Impact Review Board – Environmental Assessment Referral

On August 1, 2001, the Review Board decided to conduct an EA on the Pipeline and Gathering System Project in accordance with subsection 126 (3) of the MVRMA. The Review Board decided to conduct an environmental assessment under subsection 126(3) because the MVLWB's preliminary screening did not include the full scope of the development. The preliminary screening had only included those parts of the development that were within the Mackenzie Valley. It did not include those parts of the development that were within Alberta.

The Review Board is responsible for the assessment of the environmental, socio-economic and cultural impacts of the proposed development according to Part 5 of the MVRMA. The Review Board must conduct the EA in accordance with Section 117 (2) of the MVRMA. Upon completion of the EA, the Review Board is required to make a decision in accordance with Section 128 (1), to prepare and submit its report of environmental assessment in accordance with Section 128 (2), and submit its written reasons, required by Section 121, to the Federal

Minister of INAC and the Designated Regulatory Agency (DRA), which is the National Energy Board (NEB).

National Energy Board Applications

On November 21, 2000, Paramount applied to the NEB pursuant to Subsection 5.1(5) of the *Canada Oil and Gas Operations Act* (COGOA) for the approval of an amendment to the 1992 Paramount Cameron Hills Oil Development Plan. Approval by the NEB and consent of the Governor in Council of Part 1 of a Development Plan is an MVRMA preliminary screening trigger. On June 5, 2001, the NEB requested that the MVLWB include the Amended Development Plan in the scope of the MVLWB preliminary screening.

On June 29, 2001, Paramount submitted an application to the NEB pursuant to Section 58 of the *National Energy Board Act* (NEBA) for the construction and operation of the Cameron Hills Pipeline and Fuel Gas Pipeline Project. This development would use one pipeline to transport the raw oil and natural gas from the gathering system battery to a connection with a gathering system pipeline in Alberta and would use another parallel pipeline to transport fuel gas from an Alberta fuel gas pipeline to the gathering system battery.

Section 18 of the *Canadian Environmental Assessment Act* (CEAA) required the NEB to complete a screening on the Cameron Hills Pipeline and Fuel Gas Pipeline Project. In a letter dated July 18, 2001, the NEB initiated the screening, as per Section 5 of the CEAA, and declared that it is a Responsible Authority (RA). It also requested various regulatory agencies to respond by August 10, 2001 to indicate if the agencies were an RA under Section 5 of the CEAA and would provide specialist or expert information to the NEB.

Review Board – NEB Environmental Assessment Collaboration

Since aspects of the development were within the jurisdiction of both the Review Board and the NEB and both Boards intended to complete an environmental assessment¹ of the development, the Review Board indicated in a letter to the NEB dated August 2, 2001 that it would like to negotiate a collaborative environmental assessment process with the NEB based on the December 2000 *Memorandum of Understanding* (MOU) between the two Boards. The intent of the MOU and the collaborative EA process was to undertake one environmental assessment and to share information and analysis but to still produce two reports in respect of each Board's independent decision-making authority.

On August 17, 2001, Review Board staff met with NEB staff to develop the operating framework of the collaborative EA process that would be used by the Review Board and the NEB (hereinafter referred to as "the Boards"). The principles of the collaborative EA process were:

- The EA would be conducted in accordance with both the MVRMA and the CEAA and meet the legislative requirements of both an environmental assessment as defined in the MVRMA and a screening as defined in the CEAA.
- The definitions of "environment" and "impact on the environment" as provided in the MVRMA would be used in this EA.
- The definition of "impact on the environment" was expanded to include "any change to the project that may be caused by the environment" as contained in the CEAA definition of "environmental effect".
- The joint Work Plan that would be developed would establish mutually acceptable activities and milestone dates for the completion of the EA.

1 An "environmental assessment" by the Review Board and a "CEAA screening" by the NEB are similar in both the scope of the assessment and the level of detail required. Henceforth, the term "environmental assessment" will be used predominantly.

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- Any evidence would be placed on the Public Registries of both Boards.
- Information and analysis would be shared between the Boards' staff.
- The Review Board would first produce its Report of Environmental Assessment and then the NEB would produce its CEAA Screening Report.

Indian and Northern Affairs Canada – Benefits Plan

Section 5.2 of COGOA requires an oil and gas developer to submit a Benefits Plan to INAC for Indian and Northern Affairs Canada's (INAC's) approval. Paramount had an existing Benefits Plan for the Cameron Hills development that was approved by INAC on January 16, 1992 but this Benefits Plan only covered oil development. Paramount had to submit another Benefits Plan to INAC that covered the natural gas portion of the development. Paramount submitted this plan on March 30, 2001 and it was approved by INAC on September 25, 2001. Both the 1992 and the 2001 Benefits Plans are now in effect for the development.

2 Physical and Biological Environment²

The following brief description of the physical and biological environment is intended to provide some context for the reader. More detailed descriptions can be found in the two Environmental Impact Assessment reports that were submitted to the Review Board by Paramount.

The development area is located within the Cameron Hills Uplands, a major physiographic feature of the Northern Alberta Uplands Ecoregion within the Taiga Plains Ecozone. The Cameron Hills Uplands rise 400 to 500 m above the surrounding lowlands with steep slopes on the eastern and northern sides.

The Taiga Plains Ecozone represents the transitional zone between the boreal coniferous forest to the south and the tundra to the north. The Northern Uplands Ecoregion is characterized by undulating to rolling plains covered with organic deposits and underlain by sporadic discontinuous permafrost. Surface materials consist of bedrock, glacial drift and postglacial sediment.

The Cameron River flows southwesterly from its headwaters near the plateau's high point at the north-east corner and continues through the middle of the plateau within a comparatively wide, subdued floodplain before turning north, where it forms a valley about 300 m deep, and eventually drains into Tathlina Lake. The terrain north of the river is rolling or undulating with comparatively steep slopes. The terrain south of the river is generally more subdued, comprised of extensive lakes and lowlands.

Vegetation of the Taiga Plains Ecozone is characterized by an open, generally slow-growing, conifer-dominated forest (predominantly black spruce). The shrub component is often well developed and includes dwarf birch, Labrador tea and willow. Bearberry, mosses and sedges are the dominant understory. Mixed wood forests characterized by white and black spruce, lodgepole pine, tamarack, white birch, trembling aspen and balsam poplar tend to establish in upland and foothill areas and southerly locales that are warmer and better drained. Sixteen rare plant species have the potential for occurrence within the development area. None of the plant species are listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Characteristic mammal species include moose, woodland caribou, wolf, black bear, red fox, marten, beaver, snowshoe hare, lynx, squirrel and a number of voles, mice and shrews. Common bird species include the common red-poll, gray jay, common raven, red-throated loon, northern shrike, sharp-tailed grouse and fox sparrow. The Canadian Wildlife Service does not have any key migratory habitat sites identified in the regional development area. Fish species found in the region include northern pike, arctic grayling, walleye, lake whitefish and lake trout. COSEWIC listed wildlife species include anatum peregrine falcon (threatened), woodland caribou (threatened), wood bison (threatened), wolverine (special concern), grizzly bear (special concern), short-eared owl (special concern) and yellow rail (special concern).

The climate is classified as a sub-humid high boreal ecoclimate with cool summers and very cold winters. Mean annual precipitation ranges from 350 to 500 mm. The frost-free period is between 59 and 72 days with local variation based on topography and elevation.

2 This description was developed based largely on documentation from Paramount and other documents on the Public Registry.

3 Social, Cultural and Economic Environment³

Archaeologists at the Prince of Wales Northern Heritage Centre (PWNHC) indicated that ancestors of the indigenous Slavey used the lands around the Cameron Hills for approximately 4000 years.

The development is primarily situated on Crown lands within the Deh Cho region of the Northwest Territories. The local and regional aboriginal and community organizations have a role in reviewing the development applications and providing advice to regulators. The Deh Cho First Nations and the Government of Canada have completed an Interim Measures Agreement (IMA), which defines the roles and responsibilities of the aboriginal organizations in regulating development and planning in the region. The IMA is recognition of the continuing consultations being undertaken on land, resources and governance issues in the region that will culminate with the Deh Cho Final Agreement.

The communities most likely to be impacted by the proposed development include Kakisa, Hay River Reserve, Fort Providence, West Point First Nation, Enterprise, Hay River and Indian Cabins. Paramount notes that both aboriginal and non-aboriginal residents participate routinely in a mixed economy with the primary land uses of the area being hunting, trapping, oil and gas development and some timber harvesting. Many residents are actively seeking sustainable economic diversification.

Trapping typically occurs in the winter when the pelts are prime. Hunting on the plateau of the Cameron Hills is limited, possibly due to the poor access to the area. Some moose hunting may occur on the plateau in the winter by utilizing snowmobiles, however, the habitat and moose density are significantly better below the plateau. Caribou and various bird species are also hunted but moose and waterfowl are the primary game species. Fall is the primary hunting season but some spring hunting of waterfowl does occur, most notably in the Cameron River delta area. Berry harvesting usually occurs in late summer.

Although the capability for recreation in the area is generally low, activities such as camping, canoeing, viewing, photography, snowshoeing, snowmobiling and angling can all be accommodated in the area. Access into the area is primarily via winter roads and helicopter or fixed-wing aircraft. The lack of an all-weather road into the area limits land use.

³ This description was developed based largely on documentation from Paramount and other documents on the Public Registry.

4 Summary of the Environmental Assessment Process

This section of the report explains the methodology used during the environmental assessment process.

4.1 Scope of the Development

Based on documents submitted during the development of the Work Plan, the Review Board, in conjunction with the NEB, determined the scope of the development pursuant to Section 117(1) of the MVRMA. The scope of the development includes those components of the proposed development that would be included for consideration in the environmental assessment. The scope of development took into account the principal and accessory development activities.

Principal Development

The proposed development includes the Amended Development Plan and the construction and operation of the facilities, up to and including abandonment, required to extract oil and natural gas, transport it via a gathering system to a central battery, and then transport it in a transboundary pipeline to a connection point with a provincially regulated gathering system pipeline in Alberta. The development is primarily located on the plateau of the Cameron Hills in the Northwest Territories (NWT), about 75 km southwest of Enterprise, NWT and includes pipelines extending approximately 9.9 km south of the NWT/Alberta border. The principal development includes construction and operation of the following components:

- oil/gas/water gathering flowline system and well site facilities for 11 existing wells and 9 proposed wells located as follows:
 - 5 oil wells in Grid Area 60° 10' N, 117° 30' W (A-04, H-04, B-05, B-25 and G-03);
 - 6 oil wells in Grid Area 60° 10' N, 117° 15' W (C-75, M-73, M-73(2), D-74, C-74 and I-73);
 - 8 gas and oil wells in Grid Area 60° 10' N, 117° 30' W (C-50, B-08, N-28, J-37, A-05, L-47, C-19 and A-46); and
 - 1 gas and oil well in Grid Area 60° 20' N, 117° 30' W (A-73).
- a central battery located in H-03 Grid Area 60° 10' N 117° 30' W in the Northwest Territories, which includes separation, metering, liquid storage, compression, dehydration and pumping equipment;
- approximately 22 km of pipelines to connect the oil well sites to the central battery;
- approximately 37 km of pipelines to connect the natural gas well sites to the central battery; and
- approximately 15 km of 323.8 mm (NPS 12") outside diameter (O.D.) raw sour oil and natural gas pipeline from the Cameron Hills central battery to a pipeline header in Alberta located in LSD 5-24-126-22 W5M.

Accessory Developments and Activities

The completion of the principal development would require the following additional developments and activities to be constructed, operated and/or used:

- approximately 12 km of water disposal pipeline to extend from H-03 to a water disposal well at L-44 Grid Area 60° 10' N, 117° 30' W;
- approximately 11 km of fuel gas pipelines to connect to the oil well sites distribution system and/or approximately 13 km of above-ground electrical distribution system to the existing oil wells;
- test satellite facility at H-04, Grid Area 60° 10' N, 117° 30' W, which includes a test separator, safety relief tank, flare stack and knockout tank, and a wax inhibitor tank and pump;
- approximately 15 km of 88.9 mm O.D. (NPS 3") sweet fuel gas pipeline from the pipeline header located in LSD 5-24-126-22 W5M to the Cameron Hills central battery;

- two temporary construction camps: a 100 person temporary camp at N-28; and an up to 200 person temporary camp adjacent to the central battery at H-03;
- a permanent 20 person camp adjacent to the central battery for on-site production operations personnel;
- a warehouse/workshop complex at the central battery;
- borrow pits;
- a 1500 m by 100 m airstrip with an all-season access road to the central battery;
- an existing winter access road which begins at Indian Cabins, Alberta and travels approximately 33 km north-west to the south end of Paramount's Significant Discovery Area (SDA) and then north past the central battery to the individual well sites;
- production operational access to the wells and central battery will be by all-terrain vehicles (ATV) in the summer and regular vehicles and/or snowmobiles in the winter;
- the installation of three ATV bridges and a permanent jump-span vehicle bridge across four watercourses with flowlines suspended from three of the bridges; and
- any other undertakings in support of or in conjunction with the principal developments or accessory developments and activities.

Development Schedule

Paramount is proposing to begin construction activities in November 2001 and anticipates completion of construction by April 2002 (see Table 1). The construction dates are tentative and may change depending upon regulatory approvals and weather conditions.

Table 1 – Paramount's Proposed Schedule for the Development

Activity	Start Date	Duration	Completion Date
Access Preparation	November 15, 2001 to December 10, 2001	15 days	November 30, 2001 to December 25, 2001
Prepare and Set Up Camps	December 4, 2001 to December 8, 2001	4 days	December 8, 2001
Right-of-way Preparation	December 8, 2001 to January 4, 2002	45 to 60 days	February 6, 2002 to February 20, 2002
Pipe Stringing and Welding	December 18, 2001 to January 14, 2002	45 to 60 days	February 16, 2002 to March 2, 2002
Ditching and Clean-up	January 20, 2002 to February 4, 2002	35 to 45 days	March 11, 2002 to March 22, 2002
Testing	March 14, 2002 to March 20, 2002	8 to 14 days	March 22, 2002 to March 28, 2002
Construction of Powerlines	March 15, 2002	26 days	April 10, 2002
Construction of Central Battery	February 16, 2002	58 days	April 15, 2002
Commissioning	March 21, 2002 to April 7, 2002	7 to 20 days	March 28, 2002 to April 28, 2002

4.2 Scope of the Assessment

The scope of the assessment is the determination of which issues/items will be examined in the environmental assessment. In determining the scope of the assessment, the Boards were conscious of the Review Board's obligation to consider the factors listed in Section 117 (2) of the MVRMA and the NEB's obligation to consider the factors listed in Section 16 of the CEAA. As such, the scope of the assessment includes all factors listed in Section 117 (2) of the MVRMA and Section 16 of the CEAA.

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As further guidance, the Boards outlined the following factors to be in the scope of assessment.

Physical and Biological Environment

Air Quality and Climate

release of air contaminants (dust, particulate, exhaust fumes and other air contaminants)

Terrain and Soils

surficial geology
bedrock or soils

Vegetation and Plant Communities

local plant communities
rare or highly valued species
long-term, direct and indirect, habitat loss or alteration

Water Quality and Quantity

water quality impacts including contaminant loading and dispersion (including surface runoff and airborne contaminants)
water quantity impacts

Aquatic Resources and Habitat

aquatic organisms and their habitat

Wildlife and Wildlife Habitat

wildlife
wildlife habitats
migratory birds
vulnerable or endangered wildlife in Canada according to the COSEWIC list

Noise

Changes to ambient noise levels
Continuous exposure versus acute noise

Human Environment

Cultural and Heritage Resources

Places of cultural, spiritual and/or archaeological significance

Socio-Economics

Income
Employment
Local Business Opportunities
Community Quality of Life

Land and Resource Use

Traditional land use and occupation
Existing land use and occupation
Wilderness outfitting including commercial and sport fishing
Availability, abundance and quality of wildlife, fish and vegetation for harvesting
Recreational activities
Protected and/or proposed protected areas

Visual and Aesthetic Resources

Visual and aesthetic
Design components that mitigate visual and aesthetic impacts.

Cumulative Impacts

Natural environment

Socio-economic and cultural environment

Other Relevant Matters

Developer Identification and Performance Record

Tenure

*Regulatory Regime
Environmental Assessment Methodology
Public Consultation
Effects of the Environment on the Development
Accidents and Malfunctions
Alternatives to Parts of the Development
Abandonment and Restoration
Follow-up Programs*

Scope of the Factors

For this environmental assessment, the following scope of the factors will be considered:

Spatial Boundaries

- | | |
|--------------|---|
| Local: | impacts confined to the area of direct disturbance by the development, i.e., development footprint; |
| Subregional: | impacts confined to the assessment area boundaries as specified for each discipline or valued ecosystem component; or |
| Regional: | impacts extending beyond subregional boundaries but confined to the Northwest Territories or Alberta. |

Temporal Boundaries

- | | |
|--------------|---|
| Immediate: | impact duration on the order of days; |
| Short-term: | impact duration on the order of months; |
| Medium-term: | impact duration on the order of years, but less than 10 years; or |
| Long-term: | impact duration greater than 10 years. |

4.3 Work Plan

The Work Plan established the milestone dates and identified the Boards' expectations for the completion of the environmental assessment. It detailed the scope of the development and the scope of the assessment and provided directions to Paramount and others regarding their roles, responsibilities and deliverables in the EA process. On Sept. 5, 2001, the Boards authorized the Work Plan for release. The document was distributed to the developer, government, first nations and others.

In preparing the Work Plan, the Boards reviewed documents that had already been submitted by the developer. Based on this review, the Boards decided that the existing documentation was sufficient to substantially address the scope of the assessment. The Boards would proceed with the EA with any additional information from the developer obtained through the use of the Review Board's Deficiency Statement and through the use of Information Requests. As such, the Work Plan did not direct the developer to submit any information.

4.4 Conformity Analysis and Deficiency Statement

The Review Board undertook a conformity analysis to ensure that the existing documentation fully addressed the scope of the assessment⁴.

⁴ This conformity check determines whether or not the developer has provided information to address a requirement of the scope of the assessment. It does not reflect the technical adequacy of the information provided by the developer. Any additional technical information or further explanation would be requested through Information Requests (IRs).

After reviewing the existing documentation, the Review Board decided that the EA submissions by Paramount were not in conformity with the scope of the assessment. A deficiency statement was issued on Sept. 6, 2001 that instructed Paramount to provide information in the following areas:

- Developer Identification and Performance Record
- Effects of the Environment on the Development
- Accidents and Malfunctions

Paramount submitted its Deficiency Statement Response to the Review Board on Sept. 10, 2001. Upon reviewing the response, the Review Board decided that Paramount was in conformity with the scope of the assessment.

4.5 Analysis of the Evidence

An analysis of the evidence on the Public Registry was initiated upon release of the Work Plan and was co-ordinated by the staff of the Review Board and the NEB. The analysis included opportunities for regulatory authorities (RA's), expert advisors, first nations, communities, the public and other interested parties to ask questions of the developer and present their information to the Boards. The objective of this phase of the EA was to find and focus on unresolved or unclear issues, and to provide the Boards with the additional information and expert advice that would contribute to their decisions.

Information exchange during the technical analysis occurred primarily through the use of Information Requests (IRs)⁵. The IRs helped to facilitate the technical analysis of the proposed development by allowing parties to formally request additional or clarifying information of any other party.

During the course of the EA, 19 Information Requests were issued. They included:

- NEB IRs #3 to #6 directed to Paramount;
- Review Board IRs #1, #5, #6, #7, #8 and #11 directed to Paramount;
- Review Board IR #2 directed to Environment Canada (EC);
- Review Board IRs #3, #10 and #12 directed to the Government of the Northwest Territories (GNWT);
- Review Board IRs #4, #9 and #13 directed to INAC;
- GNWT IR #1 directed to Paramount; and
- Fisheries and Oceans Canada (DFO) IR #1 directed to Paramount.

NEB IRs #1 and #2 were issued to Paramount in January and April 2001, respectively, which was prior to the beginning of this EA. However, the NEB had them placed on the Public Registry as evidence for this EA.

Technical analysis reports were submitted to the Review Board by each of INAC, EC, GNWT, DFO and the legal counsel for the Ka'a'Gee Tu First Nation (KTFN).

4.6 Development Impact Boundaries

The study area selected for their cumulative impacts assessment was selected based on natural boundaries and/or buffer distances that were considered to encompass all of the existing and potential developments and their related impacts. The study area encompasses the wells, the gathering system in the NWT, the transborder pipeline and the Alberta gathering system down to the Bistcho gas plant. In total, this area comprises 196,684 hectares⁶ of

5 Information requests are an interrogatory in the form of written questions and answers.

6 A hectare is an area 100 m by 100 m in size, or 2.47 acres.

land. A larger study area was not considered to be practical, as it would diminish the relative impacts of the developments to an insignificant level.

The temporal boundaries for the assessment were limited by only considering existing, man-made disturbances and those developments that are being considered for the near future or that have been approved.

The Review Board is of the opinion that the boundaries established by Paramount are appropriate.

4.7 Determining Significance

Section 128 of the MVRMA requires the Review Board to decide, based on the evidence provided, whether or not a development will likely have a significant adverse impact on the environment or significant public concern and report their conclusion to the Federal Minister and the DRA. In this process, the Review Board has no objection to the proponent or others applying professional judgement in providing their evidence to the Review Board or to the use of previously completed reports. In fact, these process efficiencies are encouraged as long as the basis for the conclusion is documented, the expertise applied is identified and, if possible, the person and/or source of information responsible for the conclusion are also identified.

In determining impact significance, the Review Board considers the following factors:

- magnitude
- geographic extent
- timing
- duration
- frequency
- irreversibility of impacts; and
- probability of occurrence and confidence level.

The Review Board notes that Paramount considered similar significance factors in the preparation of their earlier EA reports. The Review Board also notes that the GNWT was satisfied that the information provided by Paramount on environmental assessment methodology was sufficient.

4.8 Report of Environmental Assessment

The Review Board has completed its environmental assessment of the proposed development. As part of the EA, the Review Board considered all of the information contained in the Public Registry established for this assessment. A complete list of the contents of the Public Registry is available from the Review Board.

The Review Board considered the benefits of the proposed development to the residents of the Mackenzie Valley and Canada in light of the possible environmental impacts and the public concerns expressed during the EA process. This report constitutes the reasons for decision of the Review Board and the report of environmental assessment required by the MVRMA.

5 Review Board Conclusions and Recommendations

All of the information submitted to the Review Board during this EA is on the Public Registry and is available for public access. This report discusses only those issues/items that generated comments from reviewers or were deemed by the Review Board to warrant explanation or analysis in this report.

The discussion in each of the following sections includes:

- a summary of Paramount's submissions;
- a summary of comments received from technical reviewers;
- Review Board conclusions; and
- Review Board recommendations, if any.

The Review Board's conclusions and recommendations are based upon a consideration of all of the information listed on the Public Registry. In earlier Reports of EA, the Review Board did not explicitly outline its interpretation of its authority to make recommendations under paragraph 128(1)(b) of the MVRMA. It now appears to the Board that this oversight has caused some difficulties, which should be eliminated for purposes of both this and future Reports of EA. The Review Board's understanding of its authority under paragraph 128(1)(b) is outlined as follows.

Subsection 128(1) of the MVRMA outlines the Review Board's options upon completion of an environmental assessment as follows:

- 128(1) On completing an environmental assessment of a proposal for a development, the Review Board shall,
- (a) where the development is not likely in its opinion to have any significant adverse impact on the environment or to be a cause of significant public concern, determine that an environmental impact review of the proposal need not be conducted;
 - (b) where the development is likely in its opinion to have a significant adverse impact on the environment,
 - (i) order that an environmental impact review of the proposal be conducted, subject to paragraph 130(1)(c), or
 - (ii) recommend that the approval of the proposal be made subject to the imposition of such measures as it considers necessary to prevent the significant adverse impact;
 - (c) where the development is likely in its opinion to be a cause of significant public concern, order that an environmental impact review of the proposal be conducted, subject to paragraph 130(1)(c); and
 - (d) where the development is likely in its opinion to cause an adverse impact on the environment so significant that it cannot be justified, recommend that the proposal be rejected without an environmental impact review.

The difficulties that have arisen relate to the interpretations of paragraph 128(1)(b) and subparagraph (ii) which, on their face, appear to limit the Review Board's authority to recommend measures to mitigate impacts to situations where the Review Board has found a significant adverse environmental impact. The language in these provisions also seems to require that any recommendations made must be directly linked to the finding of a significant adverse environmental impact. A strict interpretation of this paragraph would prevent the Review Board from recommending measures intended to prevent adverse environmental impacts from becoming significant. In other words, a strict reading of paragraph 128(1)(b) and subparagraph (ii) would indicate that if an

adverse environmental impact is not significant then the Review Board has no authority to recommend measures to reduce the significance of that impact (this is called the restrictive interpretation below). This result is not in keeping with good environmental impact assessment practice. In the Review Board's opinion, one of the important benefits of an EA is the opportunity to minimize all identified adverse impacts through the imposition of mitigative or remedial measures. Consequently, the Review Board rejects that narrow and restrictive interpretation of 128(1)(b). There is clear authority for a more liberal and remedial interpretation of paragraph 128(1)(b) and subparagraph (ii).

The Review Board suggests that the treatment of measures recommended under paragraph 128(1)(b) must be kept in mind as our analysis is considered. Any measures recommended by the Review Board under paragraph 128(1)(b) are considered by the federal and responsible Ministers under paragraph 130(1)(b) of the MVRMA and, in the case of an oil and gas development such as the one considered by this EA, under subsection 131(1) by the National Energy Board which is the DRA. If these authorities adopt the recommended measures, the measures must be carried out by the DRA, to the extent of the DRA's jurisdiction under subsection 131(2), and by the Land and Water Boards under Section 62 of the Act. Thus, the EA process is linked to the regulatory process and regulatory authorities must carry out any measures that have been recommended by the Review Board to minimize adverse environmental impacts and have been adopted by the appropriate decision-makers. The result is the "integrated system of land and water management" referred to in the long title of the MVRMA and required by the Gwich'in and Sahtu land claims.

The interpretation of paragraph 128(1)(b) will determine whether or not the Review Board has the authority to recommend measures to mitigate any adverse environmental impacts that are not now, but might become, significant, or only those impacts that have already been determined to be significant. This distinction is important and strikes at the heart of the EA process under the MVRMA. If the restrictive interpretation were to pertain, the EA process would, in the Review Board's view, be much less effective and could fall short of the goals articulated in paragraphs 115 (a) and (b) of the MVRMA. Those paragraphs speak to the need to protect the environment and the social, economic and cultural well-being of residents of the Mackenzie Valley. In the Review Board's opinion the level of protection will fail to achieve these statutory goals if only significant adverse impacts on the environment can be mitigated. The Review Board also points out that paragraph 115(b) makes no mention of the significance of the impacts identified as a limitation on the protection of the social, economic and cultural well-being of Mackenzie Valley residents.

The Review Board has considered this interpretation issue carefully and has decided that it has the authority to recommend measures both to reduce a significant adverse environmental impact below the level of significance and to prevent an adverse environmental impact from becoming significant.

The authority for this determination is based in section 24.3.5 (a) of the *Gwich'in Comprehensive Land Claim Agreement* and in section 25.3.5 (a) of the *Sahtu Dene and Metis Comprehensive Land Claim Agreement*. These sections are identical so we will only reproduce the language from the Sahtu claim below:

- 25.3.5 (a) Subject to 25.3.3(a), a development proposal shall be assessed by the Review Board in order to determine whether the proposed development will be likely to have a significant adverse impact on the environment or will likely be a cause of significant public concern. In making its determination the Review Board may consider terms and conditions to the proposed development which would prevent significant adverse impact on the environment and may recommend the imposition of such terms and conditions to the Minister. Such terms and conditions shall be subject to review pursuant to 25.3.14.

This provision clearly allows the Review Board to recommend terms and conditions (measures) to the Minister that are intended to "prevent significant adverse impact on the environment". This authority goes beyond the

strict interpretation of paragraph 128(1)(b) discussed above. It does not require that an impact already be determined to be significant before the Review Board can recommend measures. Instead the Review Board can recommend measures to prevent an impact that is not yet significant from becoming so. Paragraph 128(1)(b) of the MVRMA is not, in the Review Board's opinion, in this regard, consistent with these paragraphs of the Gwich'in and Sahtu land claims. The interpretation of paragraph 128(1)(b) should be more liberal to make it consistent with the land claims and consistent with section 115 of the MVRMA as well.

Section 3.1.18 of the Sahtu land claim specifies that the Agreement may be used as an aid to interpretation where there is any doubt in respect of any legislation implementing the provisions of the Agreement. Section 3.1.22 of the Sahtu land claim and Section 5 of the MVRMA specify that when there is an inconsistency or conflict between any law and a land claim agreement that the land claim agreement applies to the extent of the inconsistency or conflict. This legal hierarchy is clear. The land claim provisions are paramount. Consequently, the Review Board has decided that it has the authority to recommend measures both to reduce significant adverse environmental impacts below the level of significance and to prevent adverse environmental impacts from becoming significant. This finding is in keeping with good environmental assessment practice and is consistent with the Gwich'in and Sahtu land claims.

When measures are recommended either to reduce a significant impact below the level of significance or to prevent an impact from becoming significant, the Review Board expects that any of the recommended measures adopted by the appropriate decision-making authorities will be implemented. For greater certainty, the interpretation adopted of paragraph 128(1)(b) only expands the interpretation of the Review Board's authority under that paragraph. This does not change the responsibilities of the federal and responsible Ministers under section 130 or the DRA under section 131 in terms of their treatment of any recommendation made by the Review Board.

Where the Review Board has identified matters that are worthy of consideration by the proponent, the federal and responsible Ministers, the DRA or others but do not involve the need for measures to address an adverse impact, it has referred to its concerns as "suggestions" for their consideration. The Review Board understands that any positive response to such suggestions would not be binding. In this way the text of this Report of EA distinguishes between measures, which the Review Board intends to be binding on the developer and others, and suggestions, which are for consideration but which, if accepted, are not binding under part 5 of the MVRMA.

5.1 Air Quality and Climate

Paramount is a participant in the Voluntary Registry Challenge and stated that it is committed to actions to stabilize emissions of greenhouse gases.

Paramount identified vehicles, equipment, brush burning, oil and gas facility equipment operation, flaring and construction activities as sources of air emissions. Paramount stated that there are no residences within the development area and that wildlife biodiversity is characterized as low in the area, except for the Cameron River valley. The majority of the construction and facilities operation would occur on the plateau above the river valley.

Paramount submitted that air quality impacts associated with constructing the development components would be minor, localized, temporary and insignificant. Further, air quality and noise associated with operating the development components would meet emission and noise standards.

Paramount undertook air emissions modeling for the operations phase of the development, considering equipment and flaring emissions based upon the following development components:

- 11 oil wells on the oil gathering system;

- 2 oil wells on the gas gathering system;
- 7 gas wells on the gas gathering system;
- 1 water disposal well;
- the test satellite at H-04; and
- the central battery facility at H-03.

The transborder pipeline is not expected to release air emissions.

Paramount submitted that, based on its modeling results, predicted ground-level one-hour, 24-hour and annual SO₂ and NO₂ emissions would be within NWT and federal air quality standards.

EC and the GNWT indicated that Paramount's air quality modeling and environmental impact predictions were realistic based on the information filed. However, the GNWT was of the view that, should a higher than expected sulphur content be determined at the new wells, Paramount should be required to supply revised air quality modeling analyses to the GNWT and the MVLWB. Paramount stated that it would only recalculate its air quality modeling if the H₂S volumetric flowrate for all the gas wells combined exceeded 94 cubic metres per day on a continuous basis.

The GNWT noted that there is a possibility that one well might have a high H₂S content while others are low, and that the area around the well with a high H₂S content could be impacted. The GNWT suggested that alternatively, if the H₂S content in the gas is found to exceed 50 moles of H₂S per kilomole of gas, then Paramount should be required to suspend operations and revise the air quality modeling. The GNWT suggested that this would be more consistent with industry best practices and Alberta Energy Utility Board (AEUB) Guide 60.

In response to the GNWT's submission regarding suspension of operations and revising air quality modeling, Paramount submitted that it would have an objection to suspending operations if the H₂S level is above five percent. Paramount indicated that the reference GNWT used from AEUB Guide 60 pertains only to well testing and not to well operation. Paramount stated that the AEUB recognizes that H₂S does not significantly change from the initial analysis and once the well is in production, only flared volumes would be reported. Paramount submitted that emissions should be recalculated to determine if they are above the guidelines, and if they are above, then mitigation measures should be proposed to the MVLWB.

5.1.1 Conclusions

The Review Board notes that the construction activities would be localized and of short duration and, therefore, no detectable residual impacts on air quality would be expected to occur. Based upon expected levels of air contaminants, the Review Board is satisfied with the analysis provided by Paramount with respect to potential emissions during operation. The Review Board recognizes that once H₂S levels have been properly determined, little variation would be expected during operation.

However, the Review Board recognizes that H₂S emissions may be higher than expected and would expect Paramount to revise its air modeling in such an instance.

The Review Board concludes that the proposed development, with the implementation of Paramount's proposed mitigative measures and the Review Board's recommended measure, is not likely in its opinion to have any significant adverse impact on air quality.

5.1.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measure:

- The NEB ensure that Paramount submits revised air quality modeling analysis consistent with the provisions of the AEUB Guide 60 to the NEB, the GNWT, EC and the MVLWB in the event that higher than expected H₂S content is found in the gas. If determined necessary, the NEB should impose mitigative measures.

5.2 *Terrain and Soils*

Paramount indicated that development activities might affect the productivity of soils through compaction, rutting, changes in drainage, mixing of soil layers and soil loss through erosion.

Paramount submitted that winter construction is the primary mitigating factor that would limit adverse impacts to soil. Soil stripping and storage for later replacement would occur along the pipeline trench and at long-term facility sites such as the well sites, the central battery, the camp, the airstrip, the workshop/residence and the road to the airstrip. Paramount noted that, during winter frozen soil conditions, some admixing of subsoil and topsoil would occur despite careful soil handling. However, Paramount considered the impacts of admixing to be insignificant given the nature of the soil types in the development area.

To minimize erosion potential at facility sites, Paramount proposes to grade the sites to ensure controlled drainage. Along pipeline routes, ditch plugs, diversion berms, check dams, slash rollback and seeding would be used to mitigate erosion and promote site stabilization. Paramount stated that, in the event of warm weather and soft ground conditions, construction would be suspended if rutting occurs to a depth of 30 cm.

Paramount stated that the potential for erosion at wet areas, slopes or banks would be avoided or mitigated by a number of means, such as laying down corduroy roads where all-terrain vehicles (ATVs) would need to cross bogs, seeding in erosion prone areas, periodic inspections of the pipeline and prompt restoration.

Paramount indicated that during the operational phase, on-going assessment, conscientious repair practices and appropriate restoration would be undertaken to mitigate potential impacts to soil. Paramount further submitted that potential impacts to soil would be expected to be low in magnitude, confined to specific sites, short-term in duration and reversible.

The GNWT expressed concern regarding Paramount's reference to a rutting depth of 30 cm and submitted that, although some rutting is unavoidable, Paramount should commit to undertaking mitigative action if rutting of any depth occurs during construction.

5.2.1 Conclusions

The Review Board supports the GNWT's recommendation that Paramount undertake mitigative measures before rutting depths reach 30 cm. However, the Review Board recognizes that several factors may influence the selection of appropriate mitigation for rutting.

The Review Board notes that Paramount's mitigative measures for use during construction would be consolidated in its Environmental Protection Plan (EPP) and submitted to the NEB for approval. The Review Board expects that any criteria for implementation of mitigation for rutting would be clearly outlined in the EPP.

The Review Board notes that potential adverse environmental impacts on soils are likely to be localized, short-

term and reversible either during the operation of the development or upon reclamation.

The Review Board concludes that the proposed development, with the implementation of Paramount's proposed mitigative measures and the Review Board's recommended measure, is not likely in its opinion to have any significant adverse impact on terrain and soils.

5.2.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measure:

- The MVLWB and/or the NEB ensure that Paramount consults with the GNWT on the criteria to be used for determining when mitigative measures for rutting should be applied and for selecting which mitigative measures should be applied. These criteria should be included in Paramount's Environmental Protection Plan.

5.3 Vegetation and Plant Communities

Potential direct adverse impacts on native vegetation include loss of community type within the local area, loss of a rare species, loss of merchantable timber and loss of future timber resources. Indirect adverse impacts include the introduction of weedy or otherwise invasive species, a reduction in soil productivity, and erosion and sedimentation. Paramount's proposed development would require a total of approximately 133.5 hectares (ha) of new clearing.

Some of the factors considered for routing the flowlines and pipelines included using existing linear disturbances and avoiding sensitive habitats, in particular, riparian areas associated with the Cameron River, larger tributaries and wetlands. Paramount submitted that it sited its proposed central battery, satellite, camps, and airstrip in part to avoid drainages and watercourses and to use existing areas of disturbance.

Paramount identified other mitigation measures that it would implement to minimize adverse impacts on vegetation. Paramount proposes to keep the right-of-way (RoW) width and facility leases to the minimum dimensions needed to safely construct and operate the pipelines and facilities. Natural re-vegetation would be promoted and, where erosion potential is a concern, the site would be re-seeded. To promote natural revegetation, Paramount submitted that, with proper soil salvaging and replacement, the seeds and propagules present in the seed bank would be the basis for returning disturbed areas to as close to pre-disturbance conditions as possible. Paramount also indicated that it would assess vegetation cover during the growing seasons following construction.

The introduction of invasive or weedy species could change the species composition of the vegetation communities on and adjacent to the RoW and surface leases. Such species could invade the recently disturbed RoW soils naturally or be introduced through seed mixtures used in reclamation or for erosion and sediment control purposes. Paramount proposed to use mechanical weed control at the battery and camp sites. As well, Paramount would require that all contractors ensure that construction equipment arrive on site free of mud and weed seeds. Paramount indicated that, due to limited availability of seed that is both indigenous to the regional study area and suitable for revegetation programs, it would seed only those areas that are susceptible to erosion. Winter construction would reduce potential impacts to underlying plants due to the frozen ground conditions and the dormant state of most plants. Field surveys found no rare plants in the area of the central battery, satellite, camp, airstrip or borrow pit sites. Habitat types that have potential to support rare plants have been avoided along the pipeline routes.

The loss of vegetative cover would continue at facility sites for the duration of the project. Paramount submitted that impacts would be expected to be sub-regional in extent and medium in magnitude. Potential weed invasion

would be low in magnitude, confined to specific sites, and reversible in the short-term.

To reduce the loss of timber resources, Paramount proposed to survey and clearly mark the boundaries of the RoWs. No trees would be felled off the RoWs. Any merchantable timber remaining after corduroy road needs are met would be stacked and decked for recovery by a timber operator. Paramount submitted that loss of timber resources would be expected to be local in extent, low in magnitude, and reversible in the long-term.

The GNWT recommended that indigenous species be used for revegetation and that the introduction of exotic grass species should be avoided if possible. The GNWT expressed concern that the seed mix proposed by Paramount for use in erosion prone areas would have the potential to inhibit the establishment of native species. The GNWT recommended that the South Slave regional office of Resources, Wildlife and Economic Development (RWED) be contacted for advice on appropriate revegetation plans if erosion prone areas are identified that require immediate remedial action prior to the re-establishment of natural vegetation.

The GNWT indicated that the development area generally has a low potential for commercial timber and poor access from the NWT makes costs for recovery in the NWT prohibitive. As such, the GNWT does not consider the timber within the NWT to be merchantable. The GNWT also noted that Paramount would have to stack and deck any timber of merchantable size on cleared pushouts along the RoW. Given the above, the GNWT recommended that Paramount windrow the trees that are not required for corduroy roads.

In response, Paramount indicated that if timber is stacked on the right-of-way, there will be less space for construction and more RoW width would be required.

5.3.1 Conclusions

The Review Board notes that the relative area of disturbance that would occur as a result of the development within the regional study area is low and that vegetation would be encouraged to return to pre-development conditions. In addition, representation of all identified vegetation communities and rare species of plants would be maintained within both the local and regional study areas.

The Review Board considers the GNWT's concerns regarding the use of non-native grass species for erosion prone areas to be reasonable and supports the GNWT's recommendation that Paramount consult with RWED to develop re-vegetation plans for areas that require remedial seeding.

The Review Board notes the GNWT's recommendation regarding windrowing cleared timber and the response by Paramount. The Review Board finds that Paramount's proposed method of stacking and decking any timber of merchantable size on cleared push-outs along the RoW and notifying local timber operators of its location is more likely to ensure that the maximum positive benefits is obtained from this cleared timber. Paramount should utilize natural or previously cleared areas, as opposed to creating new clearings, to the maximum extent feasible.

The Review Board concludes that the proposed development, with the implementation of Paramount's proposed mitigative measures and the Review Board's recommended measures, is not likely in its opinion to have any significant adverse impact on vegetation and plant communities.

5.3.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measures:

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- The MVLWB and/or the NEB ensure that Paramount consults with the GNWT to develop re-vegetation plans for areas that require remedial action. These plans should be filed with the GNWT, the MVLWB and the NEB.
- The MVLWB and/or the NEB ensure that Paramount be required to develop and implement a follow-up monitoring program to assess the vegetation recovery in both seeded and unseeded areas. Paramount should periodically produce a report that compares the presence and relative abundance of indigenous and non-indigenous species in the seeded areas versus the unseeded areas. This report should be provided to the local first nations, the GNWT, the MVLWB and the NEB.

5.4 Water Quality and Quantity

The Cameron River is the largest watercourse within the development area, flowing southwest through the middle of the Cameron Hills and then turning north to flow off the hills and into Tathlina Lake. South of the Cameron River, the relief is minimal and numerous irregular shaped lakes are common. They are often shallow and typically interconnected by streams to form extensive wetlands. Much of the area has poor drainage and about 50% to 70% of the region consists of wetlands.

Water Quality

Paramount indicated that potential issues with respect to hydrology and water quality include disruption to natural drainage patterns, increased sediment to low-lying areas by ATVs traveling across corduroy road segments and contamination due to spills. Spills are discussed in Section 5.14 Accidents and Malfunctions. Exposure of the pipeline due to flood scour is discussed in Section 5.13 Effects of the Environment on the Development while potential effects on aquatic resources and habitat are discussed in Section 5.5.

Paramount proposes to build the pipeline, gathering system and associated facilities during the winter with frozen ground conditions. Paramount identified several additional standard mitigative measures to control erosion and sedimentation that it would implement during construction. The well sites, central battery, satellite, airstrip and workshop/residence would be built away from water bodies and low-lying areas. Specifically, Paramount stated that the central gas battery would be located away from watercourses and on flat and stable terrain. Temporary camps would be a minimum of 100 m away from any watercourses on slopes of less than three percent grade. Water quality would be protected by ensuring that no chemicals, fluids or portable toilets would be stored within 100 m of a drainage, ensuring appropriate containment (e.g. berms and dykes) and completing regular tank/berm integrity monitoring and inspection.

There are 21 watercourse crossings identified for the proposed development, seventeen along the gathering system and four along the transborder pipeline. Two of the crossings will be over the Cameron River. The rest would occur either on tributaries to the Cameron River or on tributaries flowing to small lakes in the area, most of which are small drainages that would be expected to have no water or be frozen to the bottom at the time of construction. Paramount stated that these would be crossed using open cut techniques (see Section 5.5 Aquatic Resources and Habitat). Paramount stated that, should flowing water be encountered at other crossings, it would use isolated flow crossing techniques rather than open cut techniques.

Four bridges will be constructed. One will be a vehicle bridge on the main access over the Cameron River. The other three bridges will be for ATVs: one over the Cameron River, one over a main tributary of the Cameron River on the northern portion of the development area, and another over a smaller drainage on the southern portion of the development area.

Paramount also stated that it would construct its temporary vehicle crossings with clean ice and snow, and v-notch or remove them at the end of construction. A third crossing of the Cameron River will be constructed using a

horizontal directional drilling (HDD) method.

In its response to concerns raised with respect to ATVs and the use of corduroy roads, Paramount indicated that the corduroy roads would be installed to allow water to flow between, under and over the logs so that there would not be any significant impediment to water movement. Paramount submitted that, due to the flotation from the balloon tires and their tread configuration, ATVs typically pick up very little dirt or mud. Paramount indicated that vehicles would be cleaned if a large amount of soil build-up were found on them. Paramount would also instruct operators to minimize their speeds to limit the potential for bouncing and shaking off dirt or mud when crossing the corduroy roads.

Paramount submitted that potential impacts to drainage patterns would be expected to be local to sub-regional in extent, low to medium in magnitude, and short-term.

DFO expressed concern regarding the use of a gravel site along the Cameron River. In response, Paramount provided site-specific details and outlined some of the mitigative measures that it would implement to minimize impacts on water quality. DFO submitted that the selection of the gravel site would meet its approval on the condition that Paramount follows appropriate mitigation measures, including those outlined in Paramount's response. DFO identified key measures, including that a vegetated buffer zone of 25 metres from the top of the riverbank be maintained and that no excavation occur below the water table or the present water level of the Cameron River.

Water Quantity

Paramount submitted that water needed for construction of the gathering system flowlines and the transborder pipeline would be from water wells. Paramount submitted that it would require approximately 12,000 cubic meters of water from a shallow, unnamed lake located approximately 1600 m west of the proposed M-73(02) well pad. Based on lake volume calculations, Paramount estimated that the total water withdrawal would result in a lowering of the lake level by 2 cm. Paramount submitted that recharge from groundwater and an adjacent bog would mitigate potential impacts to the lake. Lake and water usage would be subject to a land use permit and water license applications to the MVLWB.

Since Paramount proposes to use pneumatic testing procedures, no water would be required for pressure testing of the pipeline. However, if hydrostatic testing were to be required, Paramount submitted that it would bring the water to and from the area using tanker trucks so there would be no potential impacts on water quantity.

5.4.1 Conclusions

The Review Board is satisfied that the design and siting of the proposed facilities reduces interactions with surface water. The Review Board notes that the MVLWB regulatory process will consider the use of surface water and is satisfied that the environmental concerns would be addressed through this process.

The Review Board notes DFO's recommendations with respect to the gravel site along the Cameron River and finds them to be reasonable precautions.

The Review Board notes that Paramount's mitigative measures would be consolidated in its Environmental Protection Plan (EPP) and submitted to the NEB for approval.

The Review Board concludes that the proposed development, with the implementation of Paramount's proposed mitigative measures and the Review Board's recommended measures, is not likely in its opinion to have any significant adverse impact on water quality and quantity.

5.4.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measures:

- The MVLWB and/or the NEB ensure that a vegetated buffer zone of 25 metres from the top of the riverbank to the proposed gravel extraction site be maintained.
- The MVLWB and/or the NEB ensure that no gravel excavation occurs below the water table or the present water level of the Cameron River.

5.5 *Aquatic Resources and Habitat*

Paramount indicated that the area supports primarily warm-water sport fish species with moderate to very low fishery potential. The Cameron River and a tributary support fish, while fisheries resources are limited elsewhere.

Paramount submitted that no commercial or subsistence fishing activity presently occurs in the Cameron Hills area. Habitats for spawning, rearing and over-wintering of species supporting commercial or subsistence fisheries are limited in the development area and historical information about fish in the Cameron River is lacking.

Paramount conducted fish surveys at four of the proposed water crossings: two on the Cameron River (sites GSC 17 and 21), one on a tributary (site GSC 24) to the Cameron River and one on a tributary to Johnson Lake (TP-2). White sucker, longnose sucker, lake chub, spoonhead sculpin and brook stickleback were found. Walleye and northern pike are known to be present in Tathlina Lake. The presence of these species has been reported in the Cameron River, however, it is unclear whether or not they would be found as far upstream as the crossing locations.

Paramount identified the following potential issues: alteration to fish habitat from increased sediment loading, alteration to bank vegetation and top of banks, alteration to water quality, entrainment of fish during water intake, and chronic disturbance to the banks and beds during fording by ATVs.

At three crossings the pipeline would be suspended from bridges and one crossing of the Cameron River would be horizontal directionally drilled (HDD). At other watercourses, Paramount proposes to construct the crossings using an open cut as they will likely be frozen to the bottom or at low to negligible flows. Paramount stated that, should open water be encountered, the crossing would be constructed using an isolated flow technique. Paramount committed to limiting bed disturbance to trench width, replacing the original bed material and implementing erosion control measures (ditch plugs, diversion berms, and check dams).

Alterations to vegetation and banks would be mitigated by minimizing access width at stream crossings, re-vegetating exposed soil, re-contouring graded banks and stabilizing the banks with rock rip rap. If disturbance to banks and streambeds at ATV fording locations is noted, Paramount might lay down a small log bridge or gravel to create a stable ford.

With respect to water withdrawals required for drilling wells, Paramount identified an unnamed lake 1600 m west of pad M-73(02) as a water source (see Section 5.4). Paramount observed bullrush, water lily, and eel grass during a survey of the lake but, due to its shallow depth of 1.0 m, the lake was not considered capable of supporting a self-sustaining fish community. Regardless, 5 mm mesh water intake fish screens would be used to ensure that fish, if present, would not be entrained during water intake.

Paramount submitted that the potential for alteration to fish habitat from increased sediment loading would be expected to be subregional in extent (downstream impacts), low to medium in magnitude, and reversible in the short- to medium-term. The potential for alteration to bank vegetation and the top of banks would be expected to be confined to specific sites, low in magnitude, and reversible (stabilized) in the medium-term.

DFO stated that downstream water flow must be maintained at pre-instream work levels and that all instream work must be completed in a maximum of three days to prevent significant disruption to fish movements. Additional proposed measures to mitigate stream sedimentation include not placing bridge piles in active channels, using only material clean of fines and other contaminants below the high water mark, constructing ice/snow bridges with clean snow and ice only, and “v-notching” or removing the ice/snow bridges prior to the spring thaw.

5.5.1 Conclusions

The Review Board recognizes that the use of the HDD crossing technique and span bridge construction should effectively avoid interaction with aquatic resources and habitat in those watercourses for which fisheries resources were identified and that fisheries resources are limited elsewhere.

The Review Board is of the opinion that construction of crossings during frozen conditions or the use of isolated flow crossing techniques would limit the geographic extent and, therefore, the magnitude of adverse impacts. The Review Board notes Paramount’s commitment to restore watercourses to pre-construction profiles or otherwise stable conditions and to use clean backfill material.

The Review Board notes DFO’s recommendation with respect to maintenance of flow and a short in-stream period and finds that they are reasonable requests.

The Review Board concludes that the proposed development, with the implementation of Paramount’s proposed mitigative measures and the Review Board’s recommended measures, is not likely in its opinion to have any significant adverse impact on aquatic resources and habitat.

5.5.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measures:

- The MVLWB and/or the NEB ensure that the downstream water flow be maintained at pre-instream work water levels for isolated pipeline crossings.
- The MVLWB and/or the NEB ensure that each pipeline crossing where flowing water is encountered and an isolated crossing is used be completed as quickly as possible using acceptable methods to prevent significant disruption of fish movements.

5.6 Wildlife and Wildlife Habitat

Birds

Paramount discussed scientific research on the impacts of pipelines on northern boreal forest bird populations. Impacts included differences in bird community composition in forests adjacent to pipeline RoWs, increases in nest predation adjacent to wide RoWs as compared to narrow RoWs, and behavioural reluctance to cross wide RoWs as compared to narrow RoWs. Paramount stated that the research concluded that new pipeline construction should focus on reducing RoW width whenever possible and consider leaving forest corridors across them to facilitate wildlife movement.

Paramount submitted that its mitigation measures would minimize adverse impacts on birds through the maximum use of existing disturbance corridors and winter construction that would avoid sensitive breeding periods. Further, Paramount stated that nest trees located during construction (i.e. cavity trees) would not be cut down, if possible. Paramount submitted that disturbed habitat would regenerate through natural encroachment

with the exception of the well sites, the central gas battery and access roads and airstrip, which would be maintained until reclaimed during decommissioning.

Paramount submitted that there is typically a low density of breeding birds in the development area and that the local loss of tree cover on the RoWs would be mitigated by the presence of adjacent available nesting and foraging habitat. Further, the vegetation communities that would be expected to support the highest densities of breeding birds would be mature mixedwoods and dense old growth coniferous stands. These are located in the Cameron River valley and large tributaries which are crossed by RoWs only a few times and perpendicularly. Paramount also submitted that edge conditions created by the presence of the RoWs, access and airstrip could provide habitat for certain species that are habitat generalists.

EC noted that fragmentation would be minimized and that winter construction would avoid nesting and rearing periods. EC suggested that Paramount employ a monitoring program. The data collected could be used to develop additional mitigative measures if concerns are identified.

Mammals

Paramount stated that it minimized RoW width where feasible and that natural revegetation would promote native browse species to propagate. Further, Paramount submitted that, through the use of winter construction, disturbance to ground vegetation providing food resources for woodland caribou would be minimized. Paramount also submitted that it avoided important moose habitat, such as wetland and riparian habitat, where feasible, and that moose, during the winter, would move towards the Hay River valley to the east of the development area.

Paramount indicated that, while fragmentation can be permanent for roads, it is considered temporary for pipelines and was of the opinion that pipeline RoWs would not be a barrier to caribou movement. Paramount submitted that its primary mitigation for fragmentation was to minimize RoW width, use existing disturbances to the extent possible and natural regeneration. Paramount submitted that edge effects could be expected to diminish over time as natural regeneration occurs. Paramount cited research that noted caribou use of new vegetation on pipeline RoWs as spring and summer forage. Paramount noted that moose were observed on old seismic lines in the development area and submitted that they would not be hesitant to cross access corridors. Paramount submitted that it had observed woodland caribou and their signs in the vicinity of existing well sites and the winter road corridor in the area and noted their low numbers (100-200) in the region.

Paramount made numerous other commitments in its EIAs and other documents with the intent of minimizing specific and general impacts on wildlife. These commitments are listed in Attachment 2.

In summary, Paramount submitted that most of the potential impacts to wildlife would be expected to be local to sub-regional in extent, low to medium in magnitude, and reversible in the short- to medium-term. Impacts resulting from clearing the RoWs, such as habitat fragmentation, increased wolf predation, creation of long lines-of-sight and visual barriers to crossing, as well as the presence of artificial structures (i.e. bridges at watercourses), would likely not be completely reversible until the long-term, i.e., after decommissioning and natural re-vegetation has occurred. Paramount further submitted that the loss and alteration of habitat resulting from the proposed development would not be sufficient to trigger a decline in regional wildlife populations or biodiversity.

The GNWT indicated that it was of the opinion that habitat fragmentation and alteration would likely persist over the long term (>10 years) due to the slow growth of vegetation in the north. The GNWT submitted that species favoring early successional habitats would thrive in new disturbance areas while species favoring mature or old growth habitat types could be adversely impacted and experience localized displacement. The GNWT submitted

that, based on the findings of recent scientific research, woodland caribou could be expected to reduce their use of the well, central battery and pipeline areas over the long term. The GNWT suggested that the large area to the west of the Cameron Hills may be able to absorb woodland caribou displaced by the proposed development but noted the lack of existing research to indicate if this would occur. The GNWT concluded that the impacts of habitat alteration and fragmentation are both positive and negative and it is not possible to conclude which is the greater impact.

The GNWT stated that windrow breaks should be 10 m in width every 60 m to maximize opportunities for wildlife to both cross the RoW and to escape from the RoW should they encounter humans or vehicles. The GNWT also submitted that frequent breaks in windrows interrupt the fuel supply available to forest fires. Paramount responded that 10 m breaks every 60 m might impede construction and might result in more RoW width being required (i.e., wider windrows to accommodate the more frequent breaks).

The GNWT noted that the presence/absence of wildlife must be determined through ground surveys. Therefore, the GNWT recommended that Paramount consult with hunters and trappers who are knowledgeable about the area as part of their on-going traditional knowledge study. Further, the GNWT recommended that, should harvesters identify areas of particular importance for wildlife, Paramount should commit to developing and implementing appropriate mitigation measures to avoid impacts to those areas.

The GNWT concluded that it concurs with Paramount that the proposed development is not of sufficient scale to cause a decline in regional wildlife populations or biodiversity.

5.6.1 Conclusions

The Review Board notes that, due to the proposed winter construction schedule, the principal disturbances to birds would likely be associated with noise and visual disturbances related to the operation of the central gas battery, well sites and access. The Review Board also recognizes that auditory and visual disturbances would be localized and steady in nature and for access activities, localized and infrequent. The Review Board further notes the high mobility of birds and is satisfied that the disturbance area of the development is relatively small relative to the available habitat in the regional study area.

The Review Board recognizes that the primary adverse development-related impact on mammals would be associated with noise from facilities, human activity and access activity. The Review Board notes the relatively short construction period, the relatively low activity levels anticipated during operation and the lack of significant amounts of new development-related access routes. The Review Board recognizes that Paramount would encourage natural vegetation to re-establish on the pipeline right-of-way and that, in forested areas, wildlife habitat would be effectively changed to an open shrub-immature treed habitat.

The Review Board is satisfied that, based on the predicted area of disturbance and the relatively large amount of available habitat in the area, adverse impacts associated with loss of habitat or reduced habitat quality would be minimal.

The Review Board notes the recommendation of EC regarding wildlife monitoring and finds that the recommendation is reasonable.

The Review Board recognizes the widely differing views of Paramount (10 m every 500 m) and the GNWT (10 m every 60 m) regarding spacing of breaks in the windrows and recommends that the two parties consult during the regulatory process with the MVLWB and the NEB to determine what would be acceptable.

The Review Board notes the GNWT's recommendation that Paramount consult with hunters and trappers

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regarding wildlife use, however, the Review Board believes that Paramount has already committed to such activities through its public consultation program and the traditional knowledge study that is currently being prepared.

The Review Board concludes that the proposed development, with the implementation of Paramount's proposed mitigative measures and the Review Board's recommended measures, is not likely in its opinion to have any significant adverse impact on wildlife and wildlife habitat.

5.6.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measures:

- The MVLWB and/or the NEB ensure that Paramount implements a wildlife monitoring program that is designed in consultation with EC and the GNWT. The wildlife monitoring program data should be periodically summarized in a report that identifies potential impacts and suggests mitigative measures, if determined necessary. This monitoring report should be provided to the local first nations, EC, the GNWT, the MVLWB and the NEB.
- The MVLWB and/or the NEB consult with Paramount and the GNWT to determine an acceptable windrow break frequency and width.

5.7 Noise

With respect to noise generated by construction activities, Paramount indicated that equipment would be equipped with appropriate mufflers. Paramount submitted that noise impacts associated with construction would be minor, localized, temporary and insignificant.

For operations, Paramount submitted noise predictions for all sites that were based on specific equipment and activities anticipated at the sites, and scaled from similar facilities. All noise level estimates were given at a 15 m distance. Paramount submitted that noise evaluations would typically be concerned with impacts to an adjacent property or residence. Paramount stated that in the case of remote locations such evaluations are of little merit but noted the AEUB's nighttime noise guideline of 40 dBA at a distance of 1.5 km. Given the absence of local limits, Paramount stated that it had "made use of these numbers" in its evaluation of the development. Paramount indicated that it would take action to meet the 40 dBA limit upon receiving any reasonable complaints.

5.7.1 Conclusions

The Review Board is of the opinion that construction related noise impacts would be minor, localized, and temporary. With respect to operations, the Review Board notes that the area supports a low density of wildlife and that there are no human residents in the immediate development areas.

However, the Review Board notes that several facilities have more than one piece of equipment that would emit noise and that Paramount's analysis does not appear to consider combined noise levels at any given location. The Review Board recognizes that the AEUB guideline is designed around a "complaints" basis. Given the lack of data, and the remote location where it is unlikely people would be present to complain, the Review Board is of the opinion that Paramount should undertake a baseline noise assessment survey to establish ambient noise levels, and conduct noise surveys shortly after the commencement of operations. Subsequent environmental noise assessment surveys should also be required in the event of changes to operations or increases in throughput levels from those measured shortly after commencement of operations.

The Review Board concludes that the proposed development, with the implementation of Paramount's proposed mitigative measures and the Review Board's recommended measure, is not likely in its opinion to have any

significant adverse impact on the environment due to development noise.

5.7.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measure:

- The MVLWB and/or the NEB ensure that Paramount completes a baseline noise survey and additional noise surveys after the commencement of operations. The data collected should be compiled in a report along with any conclusions and, if required, mitigative measures. Copies of the report should be provided to the local first nations, EC, the GNWT, the MVLWB and the NEB.

5.8 Public Consultation

Paramount stated that community consultation was incorporated into all aspects of the development. The information gathered from potentially affected communities was incorporated into the development planning.

Paramount initiated an early public notification program on the Cameron Hills project on May 10th, 2000. This program included contacting local communities, trappers, aboriginal groups, regulatory agencies, local government representatives, federal and territorial government departments and area oil and gas industry participants.

Paramount has been in on-going discussions with various communities including the Hay River Reserve, Hay River, Kakisa, Fort Providence, West Point, Trout Lake, Enterprise, Indian Cabins, Dene Tha' and Assumption. Paramount has conducted "Open House" meetings in Fort Providence, Yellowknife, Hay River, Hay River Reserve, Kakisa and Calgary. Paramount published a public notice in area newspapers on August 22nd and 23rd 2000 to advise area stakeholders about the project and to invite them to contact Paramount should they have any questions or concerns. Paramount continues to provide information through a Project Update that is circulated to all stakeholders. Helicopter flights over the area have been completed with various community representatives.

Paramount invited elders and community people from Kakisa, Hay River Dene Reserve, Fort Providence, West Point and Dene Tha' to participate in traditional knowledge studies of the development area.

Paramount provided a summary of the meetings, discussions and communications that have taken place and state that the majority of the responses and reactions to the development have been positive.

Paramount has committed itself to the following on-going public consultation efforts:

- The local communities will be kept informed of the development progress by Paramount publishing and distributing its Project Updates;
- Applicable regulators and affected land users will be kept apprised of construction schedules with the Project Updates;
- Potentially affected trappers will be notified approximately 2 weeks in advance of construction;
- Paramount will make every reasonable effort to notify local communities about available employment opportunities;
- Paramount will make every reasonable effort to notify local communities and companies about available procurement opportunities;
- Paramount will continue to consult with the communities and discuss with them the impacts of the development. When it is demonstrated that the development has had a direct impact on the community, Paramount will work with the community in an attempt to enhance the positive impacts and to mitigate the negative impacts; and

- Paramount's Regulatory and Community Affairs Co-ordinator and the company's local field representative will continue to have an on-going presence in the communities if any concerns arise.

The only reviewer to provide any comments on public consultation was the legal counsel for the KTFN. The KTFN want to ensure that consultation activities by Paramount not be considered final upon the completion of this environmental assessment. They state that there does not appear to be any commitment in place to ensure that Paramount will work with the KTFN to mitigate and/or compensate for unforeseen impacts that may arise. The KTFN recommend that Paramount should commit to an on-going consultation process.

5.8.1 Conclusions

Paramount has ensured that the potentially impacted communities have had the opportunity to be informed of the development and to make known their concerns. Paramount has considered those concerns and has proposed a series of mitigation measures in response to them.

The Review Board recognizes that the KTFN are not satisfied with the public consultation efforts undertaken by Paramount. However, the commitments made by Paramount regarding future public consultation efforts are sufficient to address the recommendation of the KTFN.

The Review Board notes that Paramount's consultation effort does appear to have been lacking in two specific areas (see Section 5.11): during the development of the compensation plan and during the development of the Benefits Plan. The Review Board concludes that, with the exception of the consultation that occurred in these two areas, the consultation effort undertaken by Paramount was generally reasonable for the purposes of this EA.

5.8.2 Measures and/or Suggestions

The Review Board suggests that Paramount and the communities negotiate a mutually acceptable schedule for regular meetings to discuss the development.

5.9 Cultural and Heritage Resources

Paramount requested that the Prince of Wales Northern Heritage Centre (PWNHC) conduct a search of the Canadian Museum of Natural History's database for known heritage sites. Archaeologists at PWNHC indicated that the lands around Cameron Hills were used by ancestors of the indigenous Slavey for approximately 4000 years but did not report any known heritage resource sites for the development area.

Paramount completed a Heritage Resource Impact Assessment (HRIA) of the development area between July 31st and August 3rd 2000 during which it did not observe heritage resources. The HRIA included aerial examination of the proposed development areas, examination of existing surface exposures, examination of existing subsurface exposures and judgmental subsurface testing in areas of assessed moderate to high archaeological potential.

Paramount stated that should unexpected heritage resources be encountered during construction, all work in the immediate area of the discovery would cease until an archaeologist is able to examine the find and develop an appropriate site management plan.

In response to Review Board IR #1.8, Paramount explained the process that would be utilized in more detail. Paramount's construction inspector would make the determination that a heritage resource has been found and make the stop work order. This individual would have a minimum of eight years experience in facility and pipeline construction. Paramount submitted that this amount of experience would be sufficient to ensure that the inspector would have knowledge of all aspects of construction, including environmental and heritage resource

requirements. The inspector would be provided with a document outlining the general items that would identify a heritage resource and he would be instructed to issue a stop work order if a heritage resource was to be found.

The construction inspector would not be able to be present at all excavations as they were made but he would have radio contact with the crews. All members of the crews would be given a handout outlining the general items that would identify a heritage resource and will be instructed to notify their supervisor or the inspector when a heritage resource is found.

In summary, Paramount's process would consist of:

- The person finding the discovery would stop his work that may affect the heritage resource and notify his supervisor.
- The supervisor, in turn, would notify the inspector.
- The inspector would assess the discovery and may contact the Paramount Project Manager if he had any questions.
- If the inspector determines that the discovery was a heritage resource, he would stake and mark the area of the discovery and issue a stop work order for the area.
- The inspector would notify the Project Manager, if he hadn't already done so, of the discovery and the issuance of the stop work order.
- The Project Manager would notify the appropriate authorities and an archaeologist about the discovery.
- The archaeologist, in coordination with the inspector, would determine if there were any mitigative measures to address the discovery (e.g. re-route the alignment of the pipeline).
- Work may continue around the marked-off area if mitigative measures are taken.
- The archaeologist would assess the discovery and develop an appropriate site management plan to address the discovery. This information would be forwarded to the appropriate authorities.

The GNWT finds that the response plan outlined by Paramount would be sufficient should archaeological resources be discovered. The GNWT recommends that this plan be considered a commitment that must be fulfilled by Paramount.

In their technical review, the KTFN identify some concerns with Paramount's intended response plan in the event of a possible heritage resource discovery. Their concerns are:

- The KTFN should be informed of possible heritage resource discoveries;
- The archaeologist must consult with the KTFN in determining how or whether construction could continue;
- There should be provisions to accommodate KTFN's interests if they incur losses in heritage resources arising from the development;
- Paramount must respect the need for any ceremonial activity which may arise if a cultural resource is disturbed; and
- If crew members are to be used to identify possible heritage resources, then these crew members should be members of the KTFN, paid by Paramount to fulfill this function. The KTFN does not feel that the proposed process of providing handouts to non-KTFN crew members is sufficient to protect heritage resources.

5.9.1 Conclusions

The Review Board notes that there are no known heritage resources in the development area. As well, the total disturbed area of this development will be only 0.02% of the cumulative impacts study area (see Section 5.12

Cumulative Impacts). However, the Review Board finds that the concerns presented by the KTFN are valid and reasonable and the Review Board acknowledges that impacts are possible.

The Review Board concludes that the proposed development, with the implementation of Paramount's proposed mitigative measures and the Review Board's recommended measure, is not likely in its opinion to have any significant adverse impact on cultural and heritage resources.

5.9.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measure:

- The MVLWB and/or the NEB ensure that Paramount revises its proposed heritage resource discovery process to incorporate the concerns of aboriginal communities, including the hiring of local environmental monitors to identify potential heritage resource discoveries.

5.10 Land and Resource Use

Paramount states that the Cameron Hills is an area where aboriginal traditional land use such as trapping and hunting occurs as well as activities such as oil and gas development. Timber cutting has occurred on the east and north slopes of the Cameron Hills plateau. Although the capability for recreation in the area is generally low, activities such as camping, canoeing, viewing, photography, snowshoeing, snowmobiling and angling can all be accommodated in the area. Access into the area is primarily via winter roads and helicopter or fixed-wing aircraft. The lack of an all-weather road into the area limits land use.

Trapping typically occurs in the winter when the pelts are prime. Paramount identified several trappers who trap in the development area. Paramount has contacted the trappers to review the development, identify concerns and discuss mitigative measures. Paramount is attempting to meet with trappers who have been identified by the KTFN. The trappers will be contacted by Paramount 2 weeks prior to development activities and provided with updated development schedules as required. If the development activities impact the trappers, they will be compensated for any demonstrable loss.

A "demonstrable loss" as defined by Paramount is direct damage to trapping property that can be demonstrated to be the result of Paramount's activities in the area. The affected trapper and a Paramount representative will make the determination of damage in the field. In the event that an acceptable settlement is not reached between the trapper and Paramount, an arbitrator acceptable to both parties may be chosen to resolve the dispute.

Paramount stated that a demonstrable loss does not include compensation for lower harvests and Paramount does not have a compensation plan or policy with regards to reduced harvests. Paramount states that it will review, on a case-by-case basis, claims filed by trappers who can conclusively establish that they have sustained lower harvests directly attributable to Paramount's operations in the area. Paramount will comply fully with any requirements relative to this matter as set out in the MVRMA or other applicable legislation.

Paramount stated that, based on conversations with Elders, hunting on the plateau of the Cameron Hills was limited, possibly due to the poor access to the area. The Elders mentioned that some moose hunting may occur on the plateau in the winter by utilizing snowmobiles, however, the habitat and moose density are significantly better below the plateau. Caribou and various bird species were also hunted but moose and waterfowl were the primary game species. Fall is the primary hunting season but some spring hunting of waterfowl does occur, most notably in the Cameron River delta area.

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Paramount identifies berry picking as possibly being impacted by the development but notes that the construction period will be limited to late fall and winter so impacts will be minimized. Berry harvesting usually occurs in late summer. Given the limited summer access, impacts to berry harvesting activities in the development area are considered to be low.

Paramount explained that access to the development area by road would only be achieved during the winter months when the winter road was open and that access during this timeframe would be controlled or monitored by using a staffed or locked gate. No permanent all-weather road is planned.

Paramount will continue to consult with the communities and discuss the impacts of the development. When it is demonstrated that the development is having a direct impact on the communities, Paramount will work with the communities in an attempt to enhance the positive impacts and to mitigate the negative impacts. Paramount's Regulatory and Community Affairs Coordinator and Paramount's local field representative will continue to have an on-going presence in the communities if any concerns arise.

Paramount is presently working on a collective traditional knowledge study with the aboriginal communities that it expects to complete by the end of November 2001. The TK study is being written by Paramount, summarizing the information provided by the communities. The communities will be asked to review the draft report to ensure its accuracy. Any changes recommended by the communities will be incorporated into the final report. Any potential impacts identified by the TK study will be dealt with by incorporating mitigative measures into the environmental protection plan that will be used during all phases of the development.

To mitigate potential impacts to land and resource use, Paramount will adhere to the commitments made in its reports and other documents (see Attachment 2) and adhere to all conditions of the land use permit and other regulatory instruments. Paramount concludes that there will be no residual impacts on land use.

An Information Request was sent to the GNWT asking for their opinion on compensation for trappers and to describe any policies that they have in place. The GNWT replied that it does not have any policy in place to deal with industry compensation to harvesters for conflicting land uses. In its opinion, the matter of compensation is between the harvester, the community resource management board and the developer and the level of compensation would need to be negotiated between these groups.

The GNWT is satisfied that the information presented by Paramount is sufficient to support its conclusions regarding impacts on land and resource use. However, the GNWT recommends that, as part of its on-going traditional knowledge study, Paramount should consult with hunters and trappers who are knowledgeable about the area to identify areas of particular importance for wildlife. Paramount should commit to developing and implementing appropriate mitigation to avoid impacts to those areas.

The KTFN declare that they cannot make a conclusive submission because the traditional knowledge study has not been completed. The KTFN require time to review this study before they can assess whether their interests have been adequately included in the study and appropriately addressed. However, the KTFN did provide comments on some concerns.

The KTFN are concerned that the development will result in increased access to the area by those people working for Paramount but that there is no plan to assess how this increased access and activities will affect the KTFN and for compensating them should this access have adverse impacts on them.

The KTFN do not believe that the compensation plan as described by Paramount demonstrates good will on its part. Most trappers cannot produce written records or other proof of exact harvests from previous winters and

Paramount's approach to trapper compensation requires a level of proof that cannot be provided. As a result compensation for lower harvests is not likely and Paramount cannot realistically mitigate this impact. As well, Paramount's compensation plan does not address harvesting activities other than by trapping and fails to recognize that cultural values are also at stake.

The KTFN state that it is imperative the Review Board give effect to Crown fiduciary obligations which require the Crown to ensure that Paramount commits to a flexible compensation plan which recognizes that its activities may impinge on the KTFN's way of life and culture. Compensation must address impacts to harvesters other than trappers and impacts on culture. The KTFN state that the compensation plan is far more likely to be a success, both for Paramount and the KTFN, if Paramount develops this plan in consultation with them instead of developing it unilaterally.

The KTFN also state that Paramount must develop a plan for addressing the potential impacts of its activities on the KTFN's way of life. This sort of information should be in Paramount's traditional knowledge study.

5.10.1 Conclusions

In evaluating the evidence, the Review Board has considered the opinions expressed by the KTFN and Paramount, the evidence on the Public Registry and other information considered to be within the realm of general knowledge. The Review Board's analysis and conclusions on the issues of concern are presented below.

Increased Access

The evidence presented does not demonstrate that there will be increased access to the development area. Paramount is proposing to use an existing access route. No new access routes to the development area will be created. The current access route will be gated and locked by Paramount to prevent its use by others.

There will be increased access within the development area by Paramount's contractors and employees. Paramount has recognized the potential impacts and proposed mitigative measures (see Attachment 2) that attempt to minimize the impacts on the physical and biological environment as well as traditional land use. Paramount has committed to continuing to consult with the communities regarding impacts. If impacts are identified that were not predicted, Paramount has committed to incorporating additional mitigative measures into its environmental protection plan. The Review Board considers these commitments to be sufficient and reasonable to address KTFN's concerns regarding increased access.

Resource Harvesting Impacts and Compensation

In response to IR #12 from the Review Board, the GNWT provided a more detailed evaluation of traditional land use by the community of Kakisa. The GNWT notes that the community is very actively engaged in traditional land use, which includes hunting, fishing, trapping, woodcutting and gathering. Most, if not all, residents participate in traditional land use in one manner or another.

For country foods, the GNWT cautions that their data is collected on a territory wide basis, the data does not differentiate aboriginal people from non-aboriginal people and the data is not suitable for determining country food use in specific communities. However, the GNWT used its professional judgement and the data available to determine that reliance on the land would be likely be much higher in Kakisa than in larger NWT communities and that Kakisa families derive 50-66%, and possibly more, of their annual food basket requirements from the land. The replacement value of these country foods is estimated to be at least \$5000 per family.

The GNWT's evaluation of its trapping data revealed that over the period 1987-1997, an average of 11 trappers were operating in the Kakisa area. The GNWT cautions, however, that this number is not necessarily an accurate reflection of the actual number of trappers active in Kakisa. A trapper under the age of 16 is not eligible to sell

fur directly to an auction house. Such individuals would be required to sell fur through a relative, guardian or acquaintance over the age of 16 years. However, the GNWT estimates that a “typical” trapper in Kakisa could expect to earn approximately \$1800/year from trapping based on a total community trapping harvest value of \$20,100 and an average of 11 trappers.

The GNWT also notes that the above country food and trapping data does not, and cannot, take into account the cultural and spiritual values that exist and are associated with the maintenance of a traditional lifestyle.

The Review Board notes that the evidence indicates that although there is resource harvesting occurring in the development area, the amount of resource harvesting is not likely to be substantial with the possible exception of trappers. There are known trappers who do use the development area. The Review Board notes that Paramount has committed to mitigating the impacts on trappers and to compensating trappers for impacts that they might suffer, including both direct damage to assets and impacts on harvesting levels.

Hunting on the plateau appears to be limited with the plateau slopes, the Cameron River valley and the Cameron River delta having more suitable habitat for game species including moose and waterfowl. To reduce the potential impacts on wildlife that do use the plateau, Paramount has committed to mitigative measures (see Section 5.6 Wildlife and Wildlife Habitat and Attachment 2). As well, the Review Board has made a couple of recommendations in Section 5.6 that are intended to further reduce the impacts on wildlife.

The impacts on berry picking should be limited as the period of the most intense development activity will be the construction phase which will be occurring during the winter. As well, the total disturbed area of this development combined with other existing and future developments will be only 1.5% of the cumulative impacts study area (see Section 5.12 Cumulative Impacts) with much of this disturbed area already in stages of the revegetation process. Paramount will be promoting natural revegetation on the new disturbed areas so any impacts on berry picking will be reversible in the short to medium term. The Review Board has recommended in Section 5.3 that Paramount study the effectiveness of the revegetation process.

The Review Board shares the KTFN’s concerns regarding the limited scope of the compensation plan proposed by Paramount. Although the Review Board appreciates that Paramount would not want to commit to compensation for changes to harvesting patterns which are not caused by its own activities, the Review Board is of the opinion that the compensation plan must address impacts on land and resource use besides trapping.

The data presented by the GNWT does demonstrate that traditional land use is an important part of the lifestyle in Kakisa. Although the GNWT cannot conclusively estimate potential development impacts on these land use activities, it is clear that impacts are possible. As such, Paramount’s offer to review, on a case-by-case basis, claims for impacts to trapping assets and trapping harvests should be widened to deal with any reasonable and credible land and resource use impacts.

The Review Board also shares the KTFN’s concerns regarding the development of the compensation plan without community input or approval. The communities and Paramount should negotiate a compensation plan that is going to work effectively to satisfy all parties.

The Review Board also has reservations about the approach proposed by the GNWT, which would involve co-operative negotiation of compensation claims without any support for trappers and harvesters. The Review Board notes that in the absence of any policy, regulation or requirement for a compensation framework by either the territorial or the federal government (see Section 5.11), the developer has no legal obligation to enter into such negotiations.

Traditional Knowledge

The Review Board notes that Paramount is presently working on a collective traditional knowledge study with the aboriginal communities, including Kakisa, and that it expects to complete the study by the end of November 2001. Community resource harvesters are known to utilize the development area so the concern of the KTFN is that they cannot properly assess the development impacts on their community without the TK study.

The Review Board notes that this development has a 20-year lifespan and that the construction of a pipeline might result in induced developments in the area and possibly an increase in the scope of this development. Acquiring as much information as possible regarding traditional land use early in the process could substantially reduce or avoid future developments impacts. The Review Board has concerns about allowing this development to proceed to the construction phase without having any traditional knowledge incorporated into the development design and into the mitigative measures that are to be applied.

However, the Review Board is aware of the efforts that have been made by Paramount to acquire traditional knowledge from the KTFN over the last 16 months to avoid the current situation of having the EA finished before the TK study is finished. The Review Board also notes that Paramount has successfully acquired TK from other local first nations and that this information was utilized when Paramount designed the development and the mitigation measures.

The Review Board also notes that Paramount has committed to the following:

- The communities will be asked to review the draft TK study to ensure its accuracy;
- Any changes recommended by the communities will be incorporated into the final report; and
- Any potential impacts identified by the TK study will be dealt with by incorporating mitigative measures into the environmental protection plan that will be used during all phases of the development.

Given the above analysis, the Review Board has decided that it will not delay this EA until the collective TK study has been completed.

Summary

The Review Board concludes that the proposed development, with the implementation of Paramount's proposed mitigative measures and the Review Board's recommended measures, is not likely in its opinion to have any significant adverse impact on land and resource use.

5.10.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measures:

- Paramount is to discuss, develop and implement a wildlife and resource harvesting compensation plan with potentially affected First Nation communities – Deh Gah Go'tie First Nation, Fort Providence Metis, Ka'a'gee Tu First Nation, K'atlodeeche First Nation and West Point First Nation. The scope of the plan is to include compensation for hunting, trapping, fishing and other resource harvesting activity losses resulting from the development as agreed to by Paramount and the communities. Paramount is to commence the consultations as soon as possible, with a draft plan submitted to the communities within 60 days of EA Report acceptance by the INAC Minister and a final plan submitted to the communities within 90 days of EA Report acceptance. The plan is to apply retroactively to impacts arising from the start of construction of the gathering facilities and pipeline. If requested by Paramount or any of the communities, the GNWT and INAC are to facilitate the discussions on the plan.
- The MVLWB and/or the NEB should ensure that the affected aboriginal communities have been

provided a copy of the TK study and an opportunity to comment on the study and Paramount's proposed mitigative measures. The MVLWB and/or the NEB should ensure that Paramount implements appropriate mitigative measures to address impacts throughout the lifespan of the development.

5.11 Social and Economic Matters

The communities most likely to be impacted by the proposed development include Kakisa, Hay River Reserve, Fort Providence, West Point First Nation, Enterprise, Hay River and Indian Cabins. Paramount notes that both aboriginal and non-aboriginal residents participate routinely in a mixed economy. Paramount indicates that many residents are actively seeking sustainable economic diversification and have identified tourism, forestry and, to a lesser extent, agriculture, as long-term engines of growth in the region.

Paramount has consulted with community leaders and members throughout the development planning. Paramount identified issues of greatest socio-economic significance to affected communities through a review of historical socio-economic trends and through its public consultation program. Paramount identifies these issues to be:

- Sustainable economic diversification;
- Enhancement of local capacity; and
- Retention of traditional skills and values.

Paramount identified the following potential impacts, both positive and negative, that might occur as a result of the development:

- Employment and contracting opportunities for northerners and northern business;
- Increased interaction with the communities;
- Short-term increased utilization of existing businesses and services;
- Continued accessibility to hunting and gathering areas for traditional land users;
- Short-term increased demands on local construction capabilities and skilled labour resources;
- Population increases in the region in the short term;
- Potential minimal impact to traditional land uses such as trapping, hunting, fishing and gathering; and
- Implications for quality of life effects likely to occur during the construction phase.

To mitigate potential adverse impacts and to enhance potential positive impacts, Paramount has committed to the following:

- Paramount intends to maximize the positive benefits that may accrue from its development and eliminate or at least mitigate any adverse impacts through their commitment to the principles of fair and equal employment and training opportunities;
- Paramount will give first consideration to qualified individuals resident in the regional communities;
- Paramount will make every reasonable effort to notify local communities about available employment opportunities;
- Paramount will make every reasonable effort to notify local communities and companies about available procurement opportunities;
- Northern labour will be employed to the extent that required skills are available and rates are competitive;
- Northern businesses will be contracted to provide goods and services whenever possible on the basis of availability, reliability and cost competitiveness. However, Paramount will not implement a bid system that favours NWT contractors;

- Paramount intends to track the number of jobs provided to northerners and the number of contracts and total dollar value provided to northern businesses to ensure that local and regional skills are recognized and retained for future consideration;
- Paramount proposes to train two northerners for long-term employment required on-site if appropriate candidates are identified; and
- Paramount will attempt to locate individuals for long-term employment in the communities by advertising in the Hay River newspaper “The Hub”, by sending letters to each band office and by “word-of-mouth”.

Paramount provided the Review Board with copies of its 1992 and 2001 Benefits Plans for the development as approved by INAC. The Plans were developed to meet the requirements of COGOA and were designed to also adhere to INAC’s Benefits Statement of Principles. The Benefits Plans require Paramount to:

- Inform and consult with northern residents and businesses;
- Maximize the employment and training of northern residents by ensuring that they are able to access employment and training opportunities and that they receive first consideration for hiring when qualified and competitive;
- Facilitate the participation of northern businesses in the supply of goods and services on a fair, reasonable and competitive basis; and
- Report annually to INAC on the implementation of the Benefits Plan.

The GNWT notes that the INAC-approved Benefits Plans provided by Paramount indicate that the company cannot quantify the level of northern labour or business participation in the development at this time. The GNWT concurs with Paramount that positive socio-economic impacts will be minor and that significant adverse impacts are not likely due to the self-contained and remote nature of the construction camps. The GNWT recommends that Paramount produce a report summarizing the socio-economic impacts of the development and that the report be provided to the GNWT.

The KTFN state that the most recent INAC-approved Benefits Plan came as a surprise to them and that INAC approved the 2001 Benefits Plan without consulting the community. The KTFN note that they provided Paramount with a draft benefits plan in November 2000 but that they do not see their proposed benefits plan incorporated into the terms and conditions of the INAC Benefits Plan.

The KTFN further state that the INAC Benefits Plan may be consistent with the technical requirements of COGOA and INAC’s Statement of Principles but that these principles have not been developed consistent with Canada’s constitutional and fiduciary obligations to the KTFN. The KTFN state that a Benefits Plan must recognize that the development takes place on the KTFN’s traditional territory and that this recognition can be incorporated into a plan that prioritises KTFN bids as long as they are competitive and fair. The KTFN recommend that the Review Board require Paramount to give priority to bids made by the KTFN for any contract work for the development as long as the KTFN place competitive and fair bids.

5.11.1 Conclusions

Economic Impacts

The Review Board recognizes the commitments made by Paramount within the Benefits Plans, the EA reports and the other documents that are on the Public Registry. The Review Board also recognizes that there will be a brief period of intense activity during the construction phase but that the development activity will be greatly reduced during the production phase of the development.

The Review Board acknowledges the recommendation made by the KTFN regarding giving priority to KTFN contract bids but the Review Board is unable to support the recommendation as it was written. The Review Board is not in a position to favour one NWT community to the possible detriment of others. The Review Board does note that the intent of the KTFN's recommendation was to ensure that local businesses and labour be given a fair and equal opportunity to benefit from the development. This goal appears to be satisfied by the commitments made by Paramount in the Benefits Plans and other EA documents.

Economic impacts resulting from traditional land use impacts are discussed in Section 5.10 and are mitigated with the implementation of the Review Board's conditions recommended in Section 5.10.3.

The Review Board concludes that the proposed development, with the implementation of Paramount's proposed mitigative measures, is not likely in its opinion to have any significant adverse impact on the economic environment.

Social Impacts

The KTFN are not satisfied by the consultation efforts undertaken by Paramount and INAC during the development and approval of the Benefits Plan. They state that INAC approved the Benefits Plan without consulting them and that they never saw the document in text form until after it had been approved by INAC. Another issue for the community is the limited scope of the compensation plan that is proposed by Paramount and the fact that they were not consulted on the contents of the compensation plan. The KTFN's concerns are examined in the following sections.

Benefits Plan

With IR #1.1(e), the Review Board asked Paramount to describe the consultation effort undertaken for the development of the 2001 Benefits Plan, discuss any issues or concerns raised by the communities and explain how these issues and concerns were resolved. Paramount responded that the company commenced consultation in the Cameron Hills area over twenty years ago when Paramount began exploring for oil and gas in the area. Paramount also described the consultation that it has undertaken in the area during that time. The Review Board noted that Paramount's response did not actually answer the Review Board's question. Paramount did not describe the consultation effort undertaken *for the development of the Benefits Plan*, which was the question being asked.

On Nov. 15th, the Review Board sent a letter to Paramount to obtain a more detailed answer to IR #1.1(e). Paramount responded on Nov. 16th with a letter. Tables in the letter separated Paramount's consultation during the development of the Benefits Plan (i.e. before March 30th) and during the approval process of the Benefits Plan (i.e. between March 30th and Sept. 25th).

In reviewing the consultation that occurred before Mar. 30th, the Review Board notes that it is not clear that the communities were fully informed by Paramount of the facts that a Benefits Plan was being developed that required submission to and approval by INAC and that community concerns could result in changes being made to the Benefits Plan prior to its submission. The Review Board's impression is reinforced by the KTFN's assertion in their Nov. 23rd letter that "*the KTFN understood those meetings to be general discussions about what sorts of employment opportunities might arise*". There is no evidence that Paramount provided the communities with a draft copy of the Benefits Plan and discussed it with them before it was submitted to INAC. It is the Review Board's opinion that effective and equal negotiation could not have occurred in the event that the communities did not have a full understanding of the legal obligations on Paramount.

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In reviewing the consultation that occurred between Mar. 30th and Sept. 25th, the Review Board notes that Paramount provided copies of the Benefits Plan to the communities and discussed the contents of the Plan with them. Paramount stated that there were no concerns raised by the communities directly related to the Benefits Plan and that INAC did not express any concerns on the contents of the Benefits Plan once it was submitted. There were no Benefits Plan changes requested by either INAC or the communities. However, the Review Board is again concerned that it is not clear that the communities were fully informed by Paramount of the facts that the Benefits Plan required approval by INAC before the development could proceed and that community concerns could result in changes being made to the Benefits Plan.

The Review Board sent IR #13 to INAC to obtain information on the consultation effort by INAC during the development and approval of the Benefits Plan. INAC responded on Nov. 14th and also submitted an addendum on Nov. 27th. INAC states that its consultation on the Benefits Plan extended over the period of October 2000 to September 2001 with the most extensive discussions in the May 2001 to August 2001 timeframe. INAC provided copies of the Benefits Plan to the communities and reviewed and discussed the contents of the Plan.

In response to concerns raised by the KTFN, INAC supplied more detailed information regarding INAC's consultation with the KTFN. INAC states that the Benefits Plan had been provided to the KTFN several months before the Minister of INAC approved the Plan. During this period, INAC Petroleum Development and Benefits Division personnel from Yellowknife and Hay River were involved in consultation sessions with the leaders of the KTFN. INAC provided a consultation record that summarized discussions between INAC and the KTFN. The Review Board's review of this record has revealed the following:

- On Nov. 8th, 2000, INAC reviewed the Benefits Plan consultation, review and approval process with the KTFN;
- On July 19th, 2001, INAC advised the KTFN that a recommendation to approve the Benefits Plan would be submitted to the Minister of INAC within the next 2 weeks. Any specific concerns of the KTFN should be identified to INAC in the next 7-10 days;
- On July 25th, 2001, INAC advised the KTFN that a recommendation to approve the Benefits Plan would be submitted to the Minister;
- On Aug. 9th, 2001, INAC advised the KTFN that a recommendation to approve the Benefits Plan would be submitted to the Minister of INAC within the next 2 weeks. Any specific concerns of the KTFN should be identified to INAC in the next 7 days;
- On Aug. 20th, 2001, INAC advised the KTFN that a recommendation to approve the Benefits Plan would be submitted to the Minister.

No communities, including the KTFN, identified to INAC any specific concerns with the contents of the Benefits Plan. On Sept. 7th, 2001, INAC staff recommended that the Minister approve the Benefits Plan. On Sept. 25th, 2001, the Minister of INAC approved the Benefits Plan.

The Review Board finds that the consultation undertaken by INAC was sufficient to ensure that the communities were fully informed of the Benefits Plan development and approval process and that the communities were provided ample opportunity to make known any concerns about the contents of the Benefits Plan prior to its approval. The Review Board also finds that INAC's consultation effort was sufficient to meet its responsibilities to the communities and to compensate for the concerns the Review Board has with the consultation effort of Paramount. However, the Review Board suggests that INAC needs to improve at documenting its consultation.

Compensation Plan

Although the Review Board has already decided that the proposed development will not likely have a significant adverse impact on land and resource use (see Section 5.10) that conclusion speaks to the general impacts of the

proposed development on those components of the environment. Compensation should still be payable for the impacts of the development on individual harvesters and a compensation plan of appropriate scope is, in the Review Board's opinion, necessary. Any reasonable and credible claim for adverse impacts caused to land and resource use by the development should be the subject of compensation negotiations.

The Review Board decided to investigate the issues of compensation and Benefits Plans further to determine what Paramount and INAC were actually required to include in the Benefits Plan. The Review Board notes that in the consultation tables provided by Paramount, compensation for resource harvesting impacts was not listed as a topic when discussing the Benefits Plan.

Section 5.3 of the *Canada Oil and Gas Operations Act* (COGOA) requires that a Benefits Plan be submitted by the developer and approved by INAC. INAC's Northern Oil and Gas Directorate has a Benefits Statement of Principles that has four principles. They are:

- Industrial Benefits
- Employment and Training
- Consultation
- Compensation

The compensation portion of the INAC Statement of Principles states that:

The company will provide fair and equitable compensation, consistent with applicable territorial policies, to individuals involved in hunting, trapping and fishing in the event of adverse impacts demonstrated to result from project-related activities.

As written, this statement does not restrict compensation only to trapping or to direct damage to a trapper's assets. Impacts on harvest levels would fall within the impacts captured by this statement. A problem with the statement is that the provision of compensation is linked to applicable territorial policies. There are no territorial policies regarding this issue.

The Review Board notes that in its March 30th, 2001 letter to INAC, Paramount stated "*This Benefits Plan is consistent with Indian and Northern Affairs Canada Statement of Principles.*" However, the Review Board's examination of the 2001 Benefits Plan revealed that only the first three principles were addressed. There was no mention of compensation for resource harvesting impacts. The reason for this omission is that INAC does not require compensation provisions in the Benefits Plan. The approach that INAC has taken has been to encourage developers to include compensation provisions in the Benefits Plan but INAC does not require them.

In reviewing the 1992 Benefits Plan, the Review Board notes that there is a section titled "Compensation Plan for Hunters and Trappers", however, the section does not specifically state that Paramount would provide compensation to hunters and trappers. The section does state "...Paramount...is committed to working with local hunters and trappers". This 1992 Benefits Plan is still in effect but it only covers the oil portions of the development. As well, the wording approved by INAC does not appear to require that Paramount provide compensation for potential development impacts on harvesting.

The Review Board notes that Section 5.3 of COGOA permits INAC to develop guidelines or interpretation notes for the development and approval of Benefits Plans. Such guidelines could clarify this compensation issue, which is important in the context of small northern communities, most particularly in the areas where there are no settled land claims, like Kakisa.

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The Review Board examined the MVRMA, the NWT Waters Act and the Deh Cho First Nations Interim Measures Agreement (IMA) to determine if compensation is required by these documents.

In the MVRMA, the compensation provisions (Sections 75 to 79) only apply to the settled land claims areas and also only apply for situations in which the development is likely to substantially alter the quality, quantity or rate of flow of waters when on or flowing through Sahtu or Gwich'in First Nations lands or waters adjacent to those First Nations lands. The compensation provisions in the NWT Waters Act are also linked only to impacts due to alterations of the quality, quantity or rate of flow of water. Neither Act would apply to this situation.

Although the MVRMA does not require compensation for land use, First Nations in the settled land claim areas are protected by specific compensation provisions in their land claim agreements, for example Chapter 18 of the Sahtu land claim. Consultation provisions in the land claim agreements require consultation between the developer and communities on any issues that the communities consider relevant including impacts on wildlife harvesting and mitigative measures. These provisions also impose absolute liability on developers without the necessity for proof of fault or negligence by the claimant.

As well, in the settled land claim areas, INAC must consult with the First Nations on what should be required in the Benefits Plan before opening any land for exploration and the developer must consult with the First Nations on the contents of the Benefits Plan before submitting it to INAC. By contrast, in the unsettled land claim areas, the Benefits Plan is negotiated between the developer and INAC. The result is that within the Mackenzie Valley there is a different level of protection afforded to first nations depending upon whether they have or do not have a settled land claim agreement.

The Deh Cho First Nations IMA was in force as of May 23, 2001, four months before INAC approved Paramount's Benefits Plan. As such, the Benefits Plan was subject to the application of the IMA. Section 42(b) of the IMA states "*The benefits plan may contain provisions for.....compensation for damages relating to resource harvesting.*" The wording in the IMA is only "may" as opposed to "shall" and the IMA, as stated in Section 70, does not constitute a binding contract so the approval of the Benefits Plan without a compensation component does not technically violate the IMA. However, the Review Board feels that it is important that INAC uphold the spirit of the IMA when reviewing and approving Benefits Plans.

The position of the NEB is that compensation agreements are not within their jurisdiction and that INAC should be looking after this matter by way of their Benefits Plan. The Benefits Plan must be approved by INAC before the NEB can issue any authorizations so the NEB considers the issue resolved as long as there is an approved Benefits Plan in place.

The Review Board has determined that the most significant factors to be considered in making its conclusion are:

- The development has a 20-year lifespan;
- The approval of this development may result in additional developments in the area and possibly an increase in the scope of this development;
- Community resource harvesters are known to utilize the development area;
- The GNWT does not have any resource harvesting compensation policy;
- Paramount did not consult with the communities in developing its compensation plan;
- INAC's Statement of Principles is inconsistent with the contents of the INAC-approved Benefits Plan; and
- INAC did not uphold the spirit of the Deh Cho IMA when it approved the Benefits Plan without compensation provisions.

The Review Board must also consider its obligations under Section 114 (c) and Section 115 (b) of the MVRMA. Section 114 (c) states “The purpose of this Part is...to ensure that the concerns of aboriginal people and the general public are taken into account...”. Section 115 (b) states “The process established by this Part...shall have regard to the protection of the social...well-being of residents and communities in the Mackenzie Valley.”.

Given the above factors, the Review Board finds that there has been a lack of attention paid by Paramount to the KTFN and their concerns with regards to compensation for resource harvesting impacts. The Review Board also finds that INAC has not fulfilled its responsibilities to the KTFN by approving the Benefits Plan without requiring compensation provisions.

Summary

The Review Board concludes that the proposed development, with the implementation of Paramount’s proposed mitigative measures and the Review Board’s recommended measures, is not likely in its opinion to have any significant adverse impact on the social environment. The Review Board is of the opinion that the measures addressing compensation concerns are an essential foundation for this conclusion.

5.11.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measures:

- Paramount and the communities are to cooperate to the fullest extent possible in developing the wildlife and resource harvesting compensation plan. If the parties are unable to come to an agreement on the contents of the plan within the 90 day period, an independent arbitrator shall be jointly appointed within 30 days by the GNWT and INAC. The arbitration process shall conclude within 30 days of the appointment of the arbitrator.
- Following review and acceptance of Paramount’s Cameron Hills Annual Report, INAC will provide copies of the Report to the GNWT, the Review Board, the MVLWB and the potentially affected First Nation communities. The scope of the Annual Report should detail consultations undertaken with the local communities, discuss concerns raised by the communities, describe how Paramount has addressed or intends to address these concerns and discuss what actions Paramount will take to enhance positive socio-economic impacts and mitigate negative socio-economic impacts.

The Review Board also makes the following suggestions for the attention of the affected parties:

- The GNWT should develop a procedure to determine acceptable amounts of compensation that should be provided to trappers and other resource harvesters in the event that developments are proven to have impacted their harvesting activities. If the development of this procedure determines that insufficient data is currently being collected to allow compensation to be calculated, then the GNWT should expand its data collection process to obtain the required data.
- INAC should improve the documenting of its Benefits Plan consultations.
- INAC should modify its Statement of Principles to remove the reference to “applicable territorial policies” in respect of compensation until such time as there are applicable territorial policies.
- INAC should require that compensation for resource harvesting be a required element of any Benefits Plan, in compliance with its Statement of Principles.
- INAC should develop guidelines and/or interpretation notes for the development and approval of Benefits Plans. These guidelines and/or interpretation notes should be developed in consultation with aboriginal and community organizations, oil and gas industry representatives, the GNWT and any other interested organizations.
- INAC should ensure that future Benefits Plans in the Deh Cho area, and in other unsettled land claim

areas, fulfill the spirit of Interim Measures Agreements or other such instruments.

The Review Board is of the opinion that the implementation of these suggestions would be a step in the process of ensuring that first nations within the unsettled land claim areas are afforded a level of protection for their interests and concerns that is more comparable with the level of protection afforded to first nations in the settled land claim areas.

5.12 Cumulative Impacts

Paramount identified, in its cumulative impacts assessment scoping, the past, present and known or probable future developments that were considered. Paramount submitted that the cumulative impacts that would potentially occur would be primarily from future developments. Potential future developments include the drilling, tying-in and production of up to 10 additional wells, a 3D seismic program with line spacings at 240 m and 300 m for receiver and source lines, respectively, and the potential transborder pipeline and Alberta gathering system. The extent of past and current developments was determined through field reconnaissance, historical data, forest management plans and an interpretation of maps and aerial photographs.

Paramount identified an approximately 197,000 ha study area that included natural boundaries and/or a buffer zone, and encompassed:

- the proposed gathering system and facilities;
- the potential transboundary pipeline from the central battery to 5-24-126-22 W5M in Alberta; and
- the Alberta gathering system from 5-24 to the Bistcho, Alberta gas plant.

Paramount submitted that its spatial boundary was appropriate because a larger area would diminish the relative impacts of the proposed development to an insignificant number. Paramount's temporal boundaries considered existing disturbances and those developments that are known to be considered for the near future or have been approved.

Paramount's analysis identified the following potential issues: disturbance to wildlife and wildlife habitat; access; emissions; aesthetics; induced development; and socio-economics. Only disturbance to wildlife and wildlife habitat and socio-economics are explained further in the following sections. Over-all, Paramount concludes that the development design and operation will minimize the potential for cumulative impacts and that all potential residual cumulative impacts are predicted to be not significant.

Disturbance to Vegetation and Wildlife Habitat

Paramount indicated that new disturbance resulting from the proposed development would total approximately 133.5 ha. Further, the total area of existing and potential disturbance was projected by Paramount to be approximately 2,928 ha or about 1.49 % of the 196,684 ha study area.

Paramount submitted that it minimized the physical footprint of its proposed development, including habitat fragmentation, to the extent possible and as such, minimized the magnitude and geographic extent of potential development-related cumulative impacts. Further, development-related cumulative impacts would be reversible following decommissioning and reclamation. Paramount submitted that, due to the relatively small amount of additional land disturbance, no significant, long-term cumulative impacts with respect to vegetation and habitat would be expected.

Paramount submitted that linear developments such as seismic lines and RoWs would not be expected to hinder

woodland caribou movement as the RoWs would likely only be encountered sporadically during the animal's movement. Paramount also noted that, with the exception of the well and central battery sites, natural vegetation cover would re-establish on the RoWs during the development lifespan. Paramount noted that existing seismic lines in the development area demonstrate adequate regrowth of vegetation. Paramount submitted that regenerating areas, although not matching pre-clearing composition, could provide alternate habitat for many wildlife species. Paramount submitted that the carrying capacity of the immediate development area might decrease until vegetation regeneration commences, but that the carrying capacity at a regional scale would not be affected.

Paramount indicated that development-related disturbance to wildlife would be predicted to interact cumulatively with other activities such as seismic programs and well drilling/testing that were completed in the same general area and at the same time or soon afterwards. Paramount submitted that the localized nature of its development noise and the short construction period combined with naturally low wildlife density and availability of abundant higher quality habitat in adjacent areas would limit the magnitude of adverse cumulative impacts. Paramount also submitted that wildlife would return to a given area following disturbance such as construction.

The GNWT conducted a further analysis that considered, to some extent, indirect habitat loss such as edge and buffer zones. The total affected area, using the GNWT's calculations and including all existing disturbances, came to 69,531 ha, or 35.4% of the cumulative impacts study area. The GNWT identified a lack of data or studies that suggest a critical threshold for impacted habitat may lead to a population level change in woodland caribou. The GNWT also indicated that there is a lack of data on whether or not impacted caribou will move to new, undisturbed habitat. The GNWT concludes that it cannot make recommendations respecting the significance of cumulative impacts in the study area. The GNWT notes that it is currently planning studies on the woodland caribou population in the region that should contribute to an improved understanding of the impacts of development on that species.

Socio-economic Matters

Paramount states that the proposed development will have a positive, short-term impact on the regional economy during the construction phase. The operations phase of the development will result in a positive, medium term impact that will likely be regional. The benefits would extend throughout the year for the operational life of the development and, as such, would be cumulative to the seasonal work that typically occurs in the region related to exploration. Paramount concludes that no significant cumulative impacts are predicted.

General Review Comments

DFO and INAC submitted that they were of the view that Paramount had satisfactorily documented potential cumulative impacts in the study area. INAC further concluded that Paramount demonstrated that cumulative impacts on terrain, land use and water VECs would not be significant. EC and the GNWT expressed concern regarding the uncertainty of cumulative impacts assessment in general. Both departments recognized the need for further development of techniques for conducting cumulative impact assessments.

The KTFN submitted that they do not want new cut lines to be established. The KTFN requested that new cut lines only be authorized on the condition that Paramount decommissions existing lines in order to establish new lines that would be friendlier to the environment.

5.12.1 Conclusions

The Review Board is of the opinion that Paramount has conducted an acceptable cumulative impact assessment from a development-specific basis.

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Cameron Hills Gathering System and Pipeline Development**

The Review Board notes the existing lack of thresholds for disturbance related to oil and gas activity and development in woodland caribou ranges. The Review Board also notes the low numbers of woodland caribou reported to occur in the development area, the limited access and that, during operation, human activity on the ROWs and at well sites would be infrequent. The Review Board is of the opinion that Paramount has, through its development siting and design, minimized potential cumulative impacts of its proposed development associated with woodland caribou habitat alteration and disturbance.

The Review Board notes the KTFN's request that new cut lines only be authorized on the condition that Paramount decommissions existing lines in order to establish new lines that would be friendlier to the environment. The Review Board notes that soil disturbance during the cutting of seismic lines is extremely localized and as such, the 'building blocks' for natural revegetation (i.e. soil, propagules, roots and seeds) are preserved to a great extent. Further, the Review Board notes that natural regeneration of existing seismic lines is occurring subject to site and climatic conditions. Based on the evidence submitted for the proposed development, the Review Board is not persuaded that carrying out reclamation efforts on existing cutlines would, in this instance, measurably accelerate existing regeneration processes. However, the Review Board notes Paramount's commitment to monitor revegetation success on its gathering lines and pipelines. The Review Board has already recommended in Section 5.3 that Paramount conduct studies on the success of revegetation.

The Review Board notes EC's and the GNWT's concerns regarding the uncertainties inherent in cumulative impact assessment. Given these uncertainties, the Review Board encourages Paramount to participate in the MVCIMP and in completing the NWT's Cumulative Effects Assessment and Management Strategy and Framework, as invited by Environment Canada.

The Review Board concludes that the proposed development in combination with other developments, with the implementation of Paramount's proposed mitigative measures, is not likely in its opinion to have any significant adverse cumulative impact on the environment.

5.12.2 Measures and/or Suggestions

The Review Board has no recommendations or suggestions to make with regards to cumulative impacts.

5.13 Effects of the Environment on the Development

Paramount identified the following potential effects of the environment on the development:

- pipe buoyancy in bogs;
- slope failure at stream crossings resulting in pipe rupture;
- scouring at watercourses affecting integrity of the pipe;
- effects of terrain and permafrost; and
- forest fires.

In addition to specific mitigative measures to minimize potential effects of the environment on the development, Paramount also stated that it would design its proposed facilities in accordance with current standards and regulations.

Pipe Buoyancy in Bogs

Much of the area, in particular the southern part of the development area, has poor drainage. Paramount

estimated that about 50% to 70% of the region consists of wetlands. To counteract pipe buoyancy in bogs, Paramount has proposed to use heavy-walled pipe.

Slope Failure at Stream Crossings Resulting in Pipe Rupture

A number of the proposed stream crossing sites have moderate to steeply sloping banks, in particular the Cameron River and larger tributary crossings. The potential exists for slopes, disturbed by RoW construction and in conjunction with possible underlying sporadic permafrost, to fail. Earth movement could create stress on the pipeline causing a rupture. Paramount submitted that sporadic permafrost is restricted to bogs and speckled bog areas and does not expect to find permafrost at most stream crossings. The crossings at steeper banks would be bridged rather than cut or otherwise disturbed. The pipeline would be suspended beneath the bridge for three of the four bridge crossings. At other crossings, the RoWs would be two-toned⁷ to minimize grading requirements and stabilized with rock rip rap and re-seeding.

Paramount stated that it would carry out regular inspections for potential problems and respond promptly. In case of a line break, emergency shutdown valves and emergency response procedures would mitigate the effects. Paramount submitted that the risk of pipeline rupture is considered low.

Large Flood Scouring exposing the Pipe Cover Resulting in Pipe Rupture

At larger watercourses, high flows with associated bed scour could expose and damage the pipeline protective cover, possibly causing a rupture. Using regional data of recorded annual maximum instantaneous discharges, Paramount carried out a hydrologic analysis to calculate the estimated 1:100 year instantaneous flood peak discharge. Paramount submitted that the transborder pipeline and gathering lines would be buried to accommodate a 1:100 year flood event. Permanent bridges, including those designed to suspend the gathering lines across watercourses would also be designed to accommodate 1:100 year floods. Paramount also conducted a hydraulic analysis to assess the risk of pipe exposure due to scour. Calculated scour depths ranged from about 0.5 m to about 1.8 m and corresponding recommended burial depths ranged from 1.5 m to 2.5 m.

EC expressed concern that inappropriate parameters were used in the calculation of 1:100 year flood estimates and expressed concern that both errors and uncertainties in the calculations may have led to inadequate design of the watercourse crossings. In a Nov. 6, 2001 letter to the NEB, Paramount addressed these concerns. EC responded in a Nov. 30th letter and stated that its reviewers are content with the response provided by Paramount.

Terrain and Permafrost

Most of the wells in the development and the associated facilities, including the central battery, satellite, and camp would be located on the plateau above the Cameron River valley and on stable ground. Paramount submitted that permafrost is expected to occur only in areas of bog or speckled bog, primarily in the southwest area of the proposed development. Thick-walled pipe would counter pipe buoyancy in bogs. Also, Paramount provided its “Operating Guidelines for Permafrost Areas”, which, if implemented, would mitigate effects to permafrost. Paramount stated that it would use personnel with construction experience in northern regions and permafrost conditions to facilitate proper identification of permafrost and proper implementation of Paramount’s operating guidelines.

Paramount proposes to minimize grading requirements in sloped areas by two-toning the right-of-way. Additional grading would be done at the battery, satellite, camp, workshop/residence and airstrip sites. The gathering lines

⁷ Two-toning is used to limit the need for deep cuts and additional right-of-way on steep sideslopes. The technique involves cutting a terrace a few metres upslope of the trench to provide a level base for heavy equipment and placing fill from the cut immediately downslope of the trench to provide a level base for trench spoil. A small, secondary terrace is often required immediately adjacent to the upslope side of the trench in order to maintain a safe and stable open trench. Fill from the secondary terrace is often placed separate from the trench spoil, on the upslope side of the working area.

would be buried with some localized subsidence possibly occurring as the covering roach compacts after replacement. Stripped topsoil would be salvaged and replaced at the completion of construction or, in the case of facility sites, after decommissioning.

Paramount submitted that environmental effects to permafrost integrity and terrain would be local in extent, of low magnitude, and reversible in the short-term.

Forest Fires

Paramount submitted that forest fires do occur in the Cameron Hills region but that it is experienced in operating in these types of areas. The proposed development would include remote monitoring, telemetry, and emergency shutdown capabilities to enable parts of the development to be shutdown or isolated in the event of a forest fire. The pipeline and gathering system flowlines are buried for almost their entire length, further reducing the potential for damage or ruptures due to forest fires. Paramount stated that, during construction, fire-fighting equipment would be readily available and submitted that winter construction would also reduce the potential fire hazard.

5.13.1 Conclusions

With the exception of the uncertainties regarding 1:100 year flood calculations and the potential presence of permafrost, the Review Board is satisfied that Paramount's design and mitigative measures address potential effects of the environment on the development. The Review Board notes Paramount's commitment to design and operate the pipeline in accordance with current standards and comply with the OPR 99 under the NEBA. The Review Board also notes that, through development design and site selection, Paramount would be able to avoid or adequately mitigate many of the potential adverse effects that the environment may cause to the development.

The Review Board recognizes the potential effects of environmental changes that may occur as a result of degradation of permafrost traversed by the pipeline, particularly on slopes. The Review Board will recommend that Paramount identify and monitor locations where permafrost is encountered.

The Review Board concludes that, with the implementation of Paramount's proposed mitigative measures and the Review Board's recommended measure, there is not likely in its opinion to be significant adverse effects of the environment on the development.

5.13.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measure:

- The MVLWB and/or the NEB ensure that Paramount identifies and monitors locations where permafrost is encountered. Paramount is to periodically produce a report and submit it to the GNWT, the MVLWB and the NEB.

5.14 Accidents and Malfunctions

Paramount acknowledges that there is an inherent potential for accidents or malfunctions to occur, either from mechanical failure or human error. Therefore, the company monitors its safety and environmental performance by tracking all near misses, incidents/accidents, spills/releases and regulatory deficiencies or non-compliance issues.

Paramount identified hazardous material spills as being possible due to human error or mechanical failure and discussed the possible impacts. The magnitude and duration of the impacts of accidental spills would be dependent upon the nature of the material spilled, the quantity spilled, the location of the spill, and the time of year the incident occurs. Winter conditions during construction would facilitate containment and recovery of the

spilled material and reduce the likelihood of migration to aquatic habitats or of soil contamination. Locating the well site and central battery facilities away from watercourses and on level, cleared land would also minimize migration and facilitate clean-up.

Paramount stated that it would report all reportable spills to the AEUB and the MVLWB. Paramount is currently updating its Spill Contingency Plan Manual.

Paramount identified the following additional accidents and malfunctions that may occur during operation:

- pipeline and equipment leaks and ruptures;
- emergency flaring; and
- facility explosions and fire.

A pipeline failure could result in soil or watercourse contamination from liquids and poisoning to wildlife from exposure to sour gas. Paramount submitted several mitigative strategies that would lead to a low probability for pipeline failures or equipment leaks. In the event of a failure, Paramount indicated that it would have low-pressure shutdown devices, secondary containment around storage tanks, spill kits at work sites and telemetry monitoring with alarms. Further, Paramount stated that it would site storage tanks greater than 100 m from watercourses.

Paramount indicated that de-pressuring might be required in the event of a malfunction, an emergency situation, or for maintenance purposes. De-pressuring would require the flaring of gas and lead to short-term air emissions. Paramount submitted that these events are anticipated to be infrequent because of proper monitoring, inspection, maintenance and use of automatic shutdown devices. Paramount also submitted that, to limit the amount of flaring, surface facilities could be isolated from the pipelines and that parts of the gathering system could be isolated into smaller sections.

Paramount submitted that facility or equipment fires and explosions could cause forest fires, expel emissions to the environment, contaminate soils and cause bodily harm to wildlife and personnel. Paramount also submitted that the probability of these events occurring would be low with the implementation of various mitigative techniques such as use of monitoring equipment, routine inspections and maintenance, use of a non-explosive medium for pressure testing, employment of automatic shutdown devices and use of safe work procedures and emergency response plans.

Paramount indicated that it has a Safety Manual and handbook for contractors, a Task Competency Manual for operators and an Emergency Response Plan that is being currently updated.

EC indicated that it expects Paramount's Emergency Response Plan to include a comprehensive spill contingency plan. EC also expects to receive a copy of the Emergency Response Plan and will review it then.

5.14.1 Conclusions

With the implementation of Paramount's proposed mitigation measures, the adverse impacts of an accidental spill would likely be short-term and reversible. As well, Paramount will have to have an Emergency Response Plan approved by the NEB.

A pipeline failure could occur but the location of the proposed facilities is not in close proximity to any communities and Paramount will have pipeline monitoring and shut off controls in its facilities design.

In the event of an accident or malfunction, the procedures and mitigative measures described by Paramount would ensure that a clean-up would be well-coordinated and thorough, that the impacted area would be limited in size and that any adverse environmental impacts would be temporary.

The Review Board concludes that the proposed development, with the implementation of Paramount's proposed mitigative measures and the Review Board's recommended measure, is not likely in its opinion to have any significant adverse impact due to accidents and malfunctions.

5.14.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measure:

- The MVLWB and/or the NEB ensure that Paramount consults with EC and the GNWT during the preparation of the Emergency Response Plan.

5.15 Alternatives

Paramount presented the criteria and weighting factors that were used for the selection of facility locations and pipeline routes. The criteria were:

- selecting the shortest route feasible (minimize ground disturbance and construction and reclamation costs);
- utilizing existing disturbance corridors;
- selecting a route that is feasible to build;
- selecting a route that is feasible to reclaim;
- minimizing crossing or infringing on sensitive habitat for wildlife;
- minimizing crossing or infringing on sensitive habitat for vegetation;
- selecting a route that avoids side slopes and parallel ridges;
- minimizing watercourse crossings;
- selecting a route to tie-in existing wells; and
- selecting a route to tie-in future potential wells.

Paramount provided an analysis of alternative routes for the sections of gathering lines and pipelines that Paramount was proposing to place on new disturbance corridors, instead of utilizing existing disturbance corridors. Paramount's analysis included all of the route selection criteria identified above in conjunction with a variety of landscape indices including total area disturbed, change in linear distance, number of watercourse crossings and likely extent of permafrost to be encountered. Paramount also related the route selection to vegetation communities and habitat suitability ratings for the same indicator species as those used in the environmental assessment for the proposed development.

The GNWT provided an assessment of the results for a specific portion of the gathering line routes in the NWT. Although the GNWT noted that there were some tradeoffs with respect to impacts from each route alternative, it concluded that, on balance, the proposed route was not likely to have significantly greater impacts than the alternate route.

5.15.1 Conclusions

The Review Board is of the opinion that Paramount's route selection criteria are too heavily weighted towards the shortest feasible route and that Paramount did not make maximum use of existing disturbance corridors. Over-

all, however, the Review Board finds that the route and site selection process was satisfactory and that Paramount conducted an adequate analysis of alternative routes.

The Review Board concludes that the selected pipeline routes and facility locations, with the implementation of Paramount's proposed mitigative measures, is not likely in its opinion to have any significant adverse impact on the environment.

5.15.2 Measures and/or Suggestions

The Review Board has no recommendations or suggestions to make with respect to alternatives.

5.16 Abandonment and Restoration

Paramount provided information with respect to conceptual reclamation and decommissioning plans. Paramount submitted that it would adhere to regulations in force at the time of abandonment. Using current regulations as a basis, Paramount submitted that pipelines would be disconnected from facilities, purged and capped. The aboveground facilities would be removed and the salvaged organic layer and slash would be spread back over the disturbed areas as appropriate. Bridges would be dismantled and removed, but the piles would be left in place to minimize the potential for disturbance to the banks of watercourses. Paramount also indicated that the all-season road between the camp and airstrip and the airstrip would be left in place for use by others involved in fire fighting, prospecting and other endeavors.

Post-development restoration of RoWs and “permanent” facilities are discussed by Paramount in its applications, however, abandonment of the facilities would be subject to the approval of the MVLWB and the NEB. At the time, the MVLWB and the NEB would assess final abandonment and reclamation in greater detail.

EC indicated that it encourages the concept of progressive reclamation as facilities are no longer needed.

5.16.1 Conclusions

The Review Board has considered the post-construction restoration proposed by Paramount. Post-construction reclamation of RoWs constitutes one aspect of progressive reclamation. Should Paramount decide to abandon parts of its operation (e.g. an individual well or a single gathering system flowline), restoration would be required to meet all relevant territorial, provincial, and/or federal laws and regulations. The Review Board is of the opinion that the general commitments made by Paramount regarding abandonment of facilities are appropriate at this time. Further, the Review Board is of the opinion that potential environmental impacts of abandonment activities would likely be similar to those resulting from construction activities and that Paramount has provided adequate information on how the development area will be abandoned and restored.

The Review Board concludes that abandonment activities, with Paramount proposed mitigative measures and the Review Board's recommended measure, are not likely in its opinion to have any significant adverse impact on the environment.

5.16.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measure:

- The MVLWB and/or the NEB ensure that Paramount fulfils the commitments it has made to properly abandon and restore the development area.

5.17 Follow-up Programs

Paramount described its proposed inspection and monitoring programs for both the construction and operation phases of the proposed development.

Paramount submitted that it would hire a construction inspector with a minimum of 8 years of pipeline construction experience to verify implementation of its environmental protection commitments. This inspector would have knowledge of all aspects of construction, including environmental and heritage resource requirements.

Paramount stated that during operation it would periodically monitor its facilities to assess the condition of the trenchline (including subsidence), borrow pits and watercourse crossings and identify the need for any remedial measures. Paramount also stated that, during its routine inspections, it would monitor for slope stability, erosion and the success of vegetation re-establishment. Specifically, Paramount described the erosion indicators it would monitor and the process by which it would document issues and recommended actions.

Paramount stated that it would install 2 stations to monitor total sulphation, at or near the H-03 Central Battery, which would be the area of greatest SO₂ concentration. Further, Paramount would take fluid samples from its wells on an annual basis. Paramount does not intend to conduct direct noise monitoring, but indicated that it would consider all noise-related complaints from users of the land and respond as appropriate.

Paramount obtained information on traditional activities such as hunting, fishing, berry picking and trapping from local communities and stated that it would assess and measure those activities by direct consultation with users of the land. Paramount submitted that it would continue to consult with communities and discuss development impacts. Paramount outlined the steps that it would follow if problems occur and stated that, when a development-related impact was demonstrated, it would work with the community in an attempt to enhance positive impacts and mitigate negative impacts.

5.17.1 Conclusions

The Review Board notes Paramount's commitments to adequate construction practices and mitigation measures to minimize adverse impacts on the environment. The Review Board also recognizes standard industry practice and the effectiveness of having all commitments placed in one document, an Environmental Protection Plan, for use by construction personnel. The Review Board notes that, to obtain a Production Operation Authorization for the Cameron Hills Gathering System, Paramount must, pursuant to the COGOA *Production and Conservation Regulations*, obtain NEB approval of its Environmental Protection Plan (EPP) prior to construction.

The Review Board notes that, should Paramount's transborder pipeline be approved, it would be subject to the *Onshore Pipeline Regulations* (OPR) 99 under the NEBA. Pursuant to Section 48 of OPR 99, Paramount would be required to develop and implement an environmental protection program to anticipate, prevent, mitigate and manage conditions that have a potential to adversely impact the environment. Further, pursuant to Section 8 of OPR 99, Paramount would be required to submit its environmental protection program to the NEB for approval prior to construction. Paramount stated that it anticipates filings its environmental protection program in November 2001.

Pursuant to Section 54 of OPR 99, Paramount must retain a person to inspect construction activities to ensure it complies with the terms and conditions of any Order issued by the NEB and the person must have sufficient expertise, knowledge and training to competently carry out the inspection. Paramount stated that during the course of field activities, its Project Manager or Corporate Compliance Manager (or designate) would inspect the development to ensure that the requirements were being met.

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The Review Board notes that, as required by Section 46 of OPR 99, Paramount must develop and implement a training program for its employees directly involved in the operation of its facilities, which must include training on responsible environmental practices.

The Review Board notes that it has made recommendations throughout this Report of EA that the MVLWB and the NEB require additional follow-up programs beyond what has been proposed by Paramount.

The Review Board is of the opinion that Paramount's proposed inspection and monitoring programs, combined with the requirements of the regulators and the Review Board's recommended measure, are acceptable.

5.17.2 Measures and/or Suggestions

To prevent significant adverse impacts, the Review Board recommends the following measure:

- The MVLWB and/or the NEB ensure that Paramount fulfils the commitments it has made regarding follow-up programs.

6 Review Board Environmental Assessment Decision

To make its decision, the Review Board has relied upon the information in Paramount's environmental reports, the technical reports provided by reviewers and all of the other information on the Public Registry. Having considered the evidence, the Review Board made its decision according to Section 128 of the Act.

The Review Board has concluded that the proposed development, with the implementation of the Review Board's measures and Paramount's commitments, is not likely in its opinion to have any significant adverse impact on the environment or to be a cause of significant public concern. The Review Board's recommended measures are listed in Attachment 1. Paramount's commitments are listed in Attachment 2. If these measures and commitments are not implemented (or replaced with more stringent mitigative measures), then the Review Board's conclusions about impact significance will be affected.

For the consideration of the affected parties, the Review Board has made suggestions in this Report of Environmental Assessment. These suggestions are listed in Attachment 3.

Attachment 1 – Measures Recommended by the Review Board

The Review Board expects all of its recommended measures to be implemented. If these measures are not implemented (or replaced with more stringent mitigative measures), then the Review Board's conclusions about impact significance will be affected.

- 1) The NEB ensure that Paramount submits revised air quality modeling analysis consistent with the provisions of the AEUB Guide 60 to the NEB, the GNWT, EC and the MVLWB in the event that higher than expected H₂S content is found in the gas. If determined necessary, the NEB should impose mitigative measures.
- 2) The MVLWB and/or the NEB ensure that Paramount consults with the GNWT on the criteria to be used for determining when mitigative measures for rutting should be applied and for selecting which mitigative measures should be applied. These criteria should be included in Paramount's Environmental Protection Plan.
- 3) The MVLWB and/or the NEB ensure that Paramount consults with the GNWT to develop re-vegetation plans for areas that require remedial action. These plans should be filed with the GNWT, the MVLWB and the NEB.
- 4) The MVLWB and/or the NEB ensure that Paramount be required to develop and implement a follow-up monitoring program to assess the vegetation recovery in both seeded and unseeded areas. Paramount should periodically produce a report that compares the presence and relative abundance of indigenous and non-indigenous species in the seeded areas versus the unseeded areas. This report should be provided to the local first nations, the GNWT, the MVLWB and the NEB.
- 5) The MVLWB and/or the NEB ensure that a vegetated buffer zone of 25 metres from the top of the riverbank to the proposed gravel extraction site be maintained.
- 6) The MVLWB and/or the NEB ensure that no gravel excavation occurs below the water table or the present water level of the Cameron River.
- 7) The MVLWB and/or the NEB ensure that the downstream water flow be maintained at pre-instream work water levels for isolated pipeline crossings.
- 8) The MVLWB and/or the NEB ensure that each pipeline crossing where flowing water is encountered and an isolated crossing is used be completed as quickly as possible using acceptable methods to prevent significant disruption of fish movements.
- 9) The MVLWB and/or the NEB ensure that Paramount implements a wildlife monitoring program that is designed in consultation with EC and the GNWT. The wildlife monitoring program data should be periodically summarized in a report that identifies potential impacts and suggests mitigative measures, if determined necessary. This monitoring report should be provided to the local first nations, EC, the GNWT, the MVLWB and the NEB.
- 10) The MVLWB and/or the NEB consult with Paramount and the GNWT to determine an acceptable windrow break frequency and width.
- 11) The MVLWB and/or the NEB ensure that Paramount completes a baseline noise survey and additional noise surveys after the commencement of operations. The data collected should be compiled in a report

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along with any conclusions and, if required, mitigative measures. Copies of the report should be provided to the local first nations, EC, the GNWT, the MVLWB and the NEB.

- 12) The MVLWB and/or the NEB ensure that Paramount revises its proposed heritage resource discovery process to incorporate the concerns of aboriginal communities, including the hiring of local environmental monitors to identify potential heritage resource discoveries.
- 13) Paramount is to discuss, develop and implement a wildlife and resource harvesting compensation plan with potentially affected First Nation communities – Deh Gah Go’tie First Nation, Fort Providence Metis, Ka’aa’gee Tu First Nation, K’atlodeeche First Nation and West Point First Nation. The scope of the plan is to include compensation for hunting, trapping, fishing and other resource harvesting activity losses resulting from the development as agreed to by Paramount and the communities. Paramount is to commence the consultations as soon as possible, with a draft plan submitted to the communities within 60 days of EA Report acceptance by the INAC Minister and a final plan submitted to the communities within 90 days of EA Report acceptance. The plan is to apply retroactively to impacts arising from the start of construction of the gathering facilities and pipeline. If requested by Paramount or any of the communities, the GNWT and INAC are to facilitate the discussions on the plan.
- 14) The MVLWB and/or the NEB should ensure that the affected aboriginal communities have been provided a copy of the TK study and an opportunity to comment on the study and Paramount’s proposed mitigative measures. The MVLWB and/or the NEB should ensure that Paramount implements appropriate mitigative measures to address impacts throughout the lifespan of the development.
- 15) Paramount and the communities are to cooperate to the fullest extent possible in developing the wildlife and resource harvesting compensation plan. If the parties are unable to come to an agreement on the contents of the plan within the 90 day period, an independent arbitrator shall be jointly appointed within 30 days by the GNWT and INAC. The arbitration process shall conclude within 30 days of the appointment of the arbitrator.
- 16) Following review and acceptance of Paramount’s Cameron Hills Annual Report, INAC will provide copies of the Report to the GNWT, the Review Board, the MVLWB and the potentially affected First Nation communities. The scope of the Annual Report should detail consultations undertaken with the local communities, discuss concerns raised by the communities, describe how Paramount has addressed or intends to address these concerns and discuss what actions Paramount will take to enhance positive socio-economic impacts and mitigate negative socio-economic impacts.
- 17) This measure has been deleted.
- 18) The MVLWB and/or the NEB ensure that Paramount identifies and monitors locations where permafrost is encountered. Paramount is to periodically produce a report and submit it to the GNWT, the MVLWB and the NEB.
- 19) The MVLWB and/or the NEB ensure that Paramount consults with Environment Canada and the GNWT during the preparation of the Emergency Response Plan.
- 20) The MVLWB and/or the NEB ensure that Paramount fulfils the commitments it has made to properly abandon and restore the development area.
- 21) The MVLWB and/or the NEB ensure that Paramount fulfils the commitments it has made regarding follow-up programs.

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Attachment 2 – Commitments Made by Paramount

In response to Review Board IR #11, Paramount has compiled all of its commitments into the following table. In the event that a commitment was made by Paramount that is not shown in the table, Paramount will still be required to adhere to that commitment.

The Review Board expects Paramount to fulfill all of its commitments. If these commitments are not implemented (or replaced with more stringent mitigative measures), then the Review Board's conclusions about impact significance will be affected.

Attachment 3 – Suggestions Made by the Review Board

- 1) Paramount and the communities should negotiate a mutually acceptable schedule for regular meetings to discuss the development.
- 2) The GNWT should develop a procedure to determine acceptable amounts of compensation that should be provided to trappers and other resource harvesters in the event that developments are proven to have impacted their harvesting activities. If the development of this procedure determines that insufficient data is currently being collected to allow compensation to be calculated, then the GNWT should expand its data collection process to obtain the required data.
- 3) INAC should improve the documenting of its Benefits Plan consultations.
- 4) INAC should modify its Statement of Principles to remove the reference to “applicable territorial policies” in respect of compensation until such time as there are applicable territorial policies.
- 5) INAC should require that compensation for resource harvesting be a required element of any Benefits Plan, in compliance with its Statement of Principles.
- 6) INAC should develop guidelines and/or interpretation notes for the development and approval of Benefits Plans. These guidelines and/or interpretation notes should be developed in consultation with aboriginal and community organizations, oil and gas industry representatives, the GNWT and any other interested organizations.
- 7) INAC should ensure that future Benefits Plans in the Deh Cho area, and in other unsettled land claim areas, fulfill the spirit of Interim Measures Agreements or other such instruments.