

February 2, 2007

Mackenzie Valley Environmental Impact Review Board
200 Scotia Centre
P.O. Box 938, 5102-50th Ave.
Yellowknife, NT X1A 2N7

VIA EMAIL

Attention: Mr. Patrick Duxbury

Dear Sir:

**RE: Reason for Decision and Report of Environmental Assessment:
Paramount Resources Ltd. Significant Discovery Licence 8 2D
Geophysical Program (SDL8)**

Paramount Resources Ltd. (Paramount) wrote to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) on December 21, 2006 seeking specifics on how significance was determined and the resulting proposed mitigation. We wish to thank you for your response letter of January 2, 2007.

Paramount has reviewed the MVEIRB Report of Environmental Assessment and the evidence contained in the referenced documents, which prompted our December 21 letter and this follow-up. The intent of this letter is to be more specific as to the questions that remain outstanding. Paramount believes it is in the best interest of all participants of the subject environmental assessment (EA) and the oil and gas industry as a whole to completely understand the MVEIRB process in determining significance and resulting mitigative measures proposed in the EA. Therefore, Paramount respectfully requests that the MVEIRB clearly respond to the following questions.

1) DETERMINATION OF SIGNIFICANCE

Could the MVEIRB explicitly clarify how they determined that the impact of the proposed SDL8 seismic program on boreal caribou is likely to be significant?

The MVEIRB has determined that the SDL8 seismic program proposed by Paramount "...is likely to have significant impact on boreal caribou within, and adjacent to, the SDL8 area". Paramount has reviewed all sources referenced by the MVEIRB and additional literature, and none of the references contained information that justified a conclusion of significance (see explanation below).

<p>IMPACT OF SEISMIC LINES ON BOREAL CARIBOU (James, 1999; Dyer <i>et al.</i>, 2001; Oberg, 2001; Dyer <i>et al.</i>, 2002; Gunn <i>et al.</i>, 2004; BCC, 2005)</p>	<p>Linear developments may affect boreal caribou negatively by reducing the effectiveness of adjacent habitat, facilitating predation by wolves and humans and acting as partial barriers to caribou movement (BCC, 2005). However, Dyer <i>et al.</i> (2002) showed that seismic lines were not barriers to caribou movements and, in their earlier work, that caribou avoided human developments according to the level of human activity (Dyer <i>et al.</i>, 2001). In view of that, impact of seismic lines is believed to be attributable to their facilitation of travel by humans and predators rather than the clearings themselves (James, 1999; Dyer <i>et al.</i>, 2001; Oberg, 2001; BCC, 2005).</p> <p>Through development of a model¹ to predict boreal caribou habitat value in the Deh Cho Region, Northwest Territories, Gunn <i>et al.</i> (2004) found that boreal caribou were not associated with increasing outline density. To explain this counterintuitive prediction, Gunn <i>et al.</i> (2004) suggested that vegetation regrowth may be a reason why the model predicts higher probability of caribou occurrence with increasing cut line length. However, Gunn <i>et al.</i> (2004) stressed that a proper experimental-based study would have to be undertaken to document causation between predictor variables and caribou distribution.</p>
<p>LINE BLOCKING AND MEANDERING (BCC, 2005; Neufeld, 2005)</p>	<p>Since linear features affect boreal caribou primarily through facilitating travel by humans and predators, line blocking may limit human and predator activity and, in turn, avoidance of seismic lines by caribou in the short-term. According to recent research out of the University of Alberta, wolves are 62% less likely to use areas where line-blocking has occurred (Neufeld, 2005). In the same way, line meandering may reduce the line-of-site and hunting success. Re-growth of woody vegetation to a substantial size ($\geq 2m$) may reduce predator access in the long-term (BCC, 2005).</p>
<p>DETERMINING SIGNIFICANCE (CWS, 2004)</p>	<p>To determine significance, environmental thresholds as defined by laws, policy commitments, recovery strategies and management plans or experts should be considered (CWS, 2004)</p>
<p>THRESHOLDS OF INDUSTRIAL ACTIVITY (Dunford, 2003a; Salmo <i>et al.</i>, 2004; GNWT, 2006)</p>	<p>The threshold amount of linear disturbance that can be tolerated before population demographics are negatively affected is unknown (GNWT, 2006). A threshold of 1.8km/km² is reported cautiously in Salmo <i>et al.</i> (2004), as it is preliminary only and based on a limited data set². Thresholds may be especially important for species whose populations are in decline and potentially limited by factors associated with multiple land uses, like caribou (Dunford, 2003a).</p> <p>In the absence of sound evidence and/or specific management objectives with universal application in the Northwest Territories, or at least in the vicinity of the proposed SDL8 seismic program, Paramount again asks, “How did the MVEIRB determine that the SDL8 seismic program proposed by Paramount is likely to have significant impact on boreal caribou within, and adjacent to, the SDL8 area?”</p>

¹ The model is more a consideration of factors associated with the distribution of caribou during late winter than a definitive predictor of habitat selection by caribou.

² In GNWT (2006), a threshold of 1.8km/km², as reported in Francis *et al.* (2002), is referenced. Since Paramount did not attend this workshop and published proceedings do not appear to be available, the companion document was reviewed and a threshold of 1.8km/km² is not reported (Anderson *et al.*, 2002).

2) MITIGATIVE MEASURES

Could the MVEIRB explicitly clarify how they determined that a meandering outline with a maximum of 2.5m would mitigate the predicted impacts to boreal caribou?

To mitigate predicted impacts to caribou, the MVEIRB has imposed meandering outlines with a maximum width of 2.5m. Paramount has reviewed all sources referenced by the MVEIRB and additional literature, and none of the references contained information that showed meandering outlines with a maximum width of 2.5m would reliably mitigate the predicted impacts to boreal caribou (see explanation below).

EFFECT OF SEISMIC LINE WIDTH ON BOREAL CARIBOU (Dunford, 2003b; Salmo <i>et al.</i> , 2004)	The effect of seismic line width on boreal caribou and predator response is unclear (Salmo <i>et al.</i> , 2004). In northeast Alberta, low-impact seismic (LIS) lines (3-5 m wide or less) were structurally different than conventional seismic lines (5-10 m wide). For example, LIS lines had more barriers and shorter lines-of-sight than conventional seismic lines, which are likely to reduce predator efficiency (Dunford, 2003b cited in Salmo <i>et al.</i> , 2004). However, this research did not specifically examine caribou response to varying seismic line widths. Rather, Dunford <i>et al.</i> (2003b) provides additional evidence to support line blocking and meandering.
MITIGATIVE MEASURES IN OTHER JURISDICTIONS (BCC, 2001; Culling <i>et al.</i> , 2004; GNWT, 2006)	Other jurisdictions attempt to mitigate adverse impacts to boreal caribou caused by seismic exploration by a combination of activity targets (which are yet to be determined) and best practices, including minimizing line width (BCC, 2001; Culling <i>et al.</i> , 2004; GNWT, 2006). Scientific evidence to support the success of best practices was not apparent (BCC, 2001; Culling <i>et al.</i> , 2004; GNWT, 2006). Perhaps the basis of best practices is available technology rather than successful mitigation of the effects of industrial activities. In British Columbia, the inability to practically apply best practices in some areas, like in the instance of the proposed seismic program, is recognized. Where best practices cannot be practically applied, a <i>Caribou Impact Assessment and Protection Plan</i> will be reviewed and either accepted, approved with terms and conditions or rejected (Culling <i>et al.</i> , 2004).
SUCCESS OF MITIGATIVE MEASURES IN OTHER JURISDICTIONS (McLoughlin <i>et al.</i> , 2003; GNWT, 2006)	In Alberta, British Columbia and Manitoba, few boreal caribou herds are stable and best practices have not been very successful in mitigating the effects of industrial activities (GNWT, 2006). For example, McLoughlin <i>et al.</i> (2003) discussed the demographics between 1993 and 2002 of caribou inhabiting 6 ranges in northeast Alberta. "Caribou populations in 3 ranges have declined at average rates exceeding those that would lead to a 50% decline from initial population size over 3 generations; another population is declining at half this rate. Populations of caribou in 2 ranges appear to be stable, declining marginally since inception of our study". In Alberta, new land-use guidelines that promote caribou conservation are required (McLoughlin <i>et al.</i> (2003). In the absence of sound evidence and/or specific management objectives with universal application in the Northwest Territories, or at least in the vicinity of the proposed SDL8 seismic program, Paramount again asks, "How did the MVEIRB determine that meandering outlines with a maximum width of 2.5m would reliably mitigate the predicted impacts to boreal caribou?"

Paramount is aware that caribou management issues are complex and management decisions are challenging, considering the lack of support provided by sound, scientific evidence. In light of the uncertainty surrounding caribou management and the absence of specific caribou management objectives in the Northwest Territories, Paramount requires a better understanding of the MVEIRB decision making process to comfortably contemplate the proposed seismic program, as well as future development in the Northwest Territories. We look forward to receiving your early response and assistance.

Yours truly,

PARAMOUNT RESOURCES LTD.



Shirley Maaskant
Manager, Regulatory and Community Affairs

CC: see distribution list

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Distribution List Feb 2 2007 MVEIRB Ltr

Organization	Contact	Position	Fax Number/e-mail
Minister of Indian and Northern Affairs Canada	The Honorable Jim Prentis, PC, QC, MP	Minister of Indian and Northern Affairs Canada	
Ka'Gee Tu First Nation	Lloyd Chicot	Chief	(867) 825-2002
	Allan Landry	Oil and Gas Adviser	
NWT Metis Nation	Ursula Vogt	IMA Coordinator	(867) 872-2772
Fort Providence Metis Local 57	Albert Laffery	President	(867) 699-4319
DIAND	Fraser Fairman	Environmental Scientist	fairmanf@inac-ainac.gc.ca
DIAND South Mackenzie District	Darnell McCurdy	District Manager	(867) 669-2720
National Energy Board	Michel Mantha	Secretary	(403) 292-5876
	Bharat Dixit	Chief Conservation Officer	
	Paula Romanchuk	Environmental Specialist	
GNWT (ENR, DOT, Prince of Wales NHC, MACA)	Gavin More	Manager, Environmental Assessment	Gavin_More@gov.nt.ca
Environment Canada	Wade Romanko	Environmental Emergencies and Assessment Officer	Wade.romanko@ec.gc.ca