

NEB File 2520-D-4-4

June 14, 2002

National Energy Board  
444 Seventh Avenue SW  
Calgary, Alberta  
T2P 0X8

Attention: Mr. Terry Baker  
Chief Conservation Officer

Dear Sir,

**Re: Paramount Resources Ltd.'s ("Paramount") Cameron Hills Oil and Gas Development Project Approved under National Energy Board ("NEB") Order EPO-01-2002 - C-50 Grid 60<sup>0</sup> 10' N, 117<sup>0</sup> 30' W ("C-50") Pipeline Failure**

The excavation and removal of the failed piping on the C-50 pipeline have been completed by following the work plan detailed in Paramount's letter of June 6, 2002. Furthermore, the cut out pipe spool has been sent to a testing laboratory to be analyzed for pipe metallurgy and weld properties. The laboratory has been requested to submit a report identifying the possible causes of the failure.

Paramount has done some preliminary investigative work to evaluate the possible causes of the failure. Mike Chevrier (CGSB Level III Radiographer Reg. #2740) of Iris NDT has examined the original radiographic film of the weld that failed and found "no indication of weld discontinuities that would have initiated the failure."

The mill certifications for the pipe used were also reviewed and no deficiencies in regards to pipe metallurgy and mechanical properties were noted.

The results of a stress analysis of the failure indicates that thermal and internal pressure effects would not have been a significant contributing factor, while the weight of overburden could have overstressed the pipe if it was unsupported due to ground settlement.

Paramount currently believes that the primary cause of failure was by the settling of the ground near the pipeline anchor location. The stresses caused by the weight of the overburden would be further aggravated by the transition from the heavy wall (11 mm) anchor pipe to the linepipe wall thickness (4.8 mm) and the rigidity of the anchor, which resulted in a lack of flexibility. Therefore the highest point of stresses would be at the weld where the failure occurred.

**Mackenzie Valley Land  
& Water Board**

**File**

JUN 19 2002

**Application #** MV2000P0055

**Copied To** BW/PLM/KH/Reg

This conclusion is supported by the following observations:

- The failure occurred with a crack on the top third of the pipe indicating tensile stress in the top of the pipe and a downward force on the linepipe.
- The surface of the trench line had visible indications of settlement near the base of the hill near the failure point.
- When the failed pipe section was removed, the non-anchored side of the failure came to rest approximately 8 inches below the anchored side.

Paramount proposes the following course of action pending the results of the laboratory analysis. The plan of action will be altered to address any other causes of failure identified by the laboratory results.

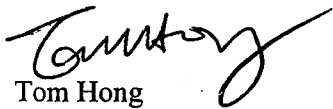
1. The transition from 11 mm to 4.8 mm wall pipe will be done in two steps with 7.2 mm wall pipe as an intermediate step. The purpose of this is to increase the flexibility and reduce the stress concentration of the pipe joining onto the anchor. A drawing is attached for reference.
2. Approximately eighteen feet of line pipe will be pre-bent to accommodate the 8" offset that has occurred due to settling. This will reduce the stresses on the pipe at the anchor.
3. The two transition pieces and pre-bent pipe spool will be welded together using the same welding procedure that was used during the original construction.
4. All the welds on the completed spool will be inspected by radiography on the full circumference of the welds.
5. A 1 hour hydrostatic test of the entire spool piece will be performed at fabrication shop.
6. The pipe spool will be transported to site and the spool will be welded in place using the same welding procedure that was used during the original construction.
7. The tie-in welds will be inspected by radiographic and ultrasonic methods.
8. Sand bags will be used to support the pipe at 3 m intervals where it does not rest on the trench floor.
9. All other locations where anchors were used in the Cameron Hills Project will be visually inspected. If there are signs of significant settlement, the pipeline will be excavated and supported with sandbags where necessary. The welds will also be inspected by radiographic and magnetic particle methods to detect any signs of cracking.

In order to expedite the repair, Paramount requests approval of the above repair work plan conditional on review of the laboratory test results of the failed section.

If you have any questions regarding this matter, please contact the undersigned at (403) 290-3696.

Yours truly,

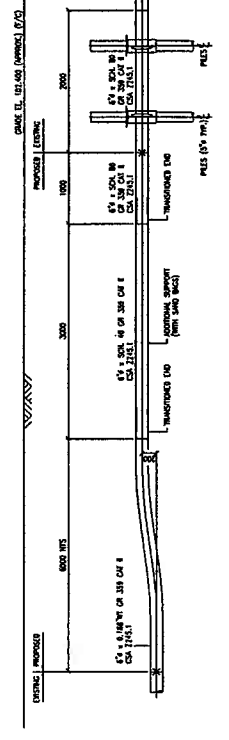
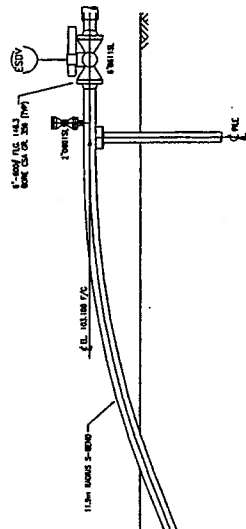
**PARAMOUNT RESOURCES LTD.**



Tom Hong  
Project Manager

Attachment

c.c. Andrew Forbes, DIAND  
Janpeter Lennie-Misgeld, MVLWB  
Brian Anderson, Paramount  
File: Cameron Hills G 3.2



REV. NEW

DRAWING NUMBER		REFERENCE DRAWINGS		DESCRIPTION OF REVISION		BY		DATE		CHKD	
		0		ISSUED FOR APPROVAL		JCH		03/13			

CADD FILE NO.: 0504TYREPAIR

**CAMERON HILLS GAS GATHERING**

**BRIDGE SITE G-50**


**6" 600# P/L RISER**

**REPAIR DETAIL**

SCALE: 1 : 30

DRAWING NUMBER: D-CH-G-50-P-02.03

REV: 0



Parsons  
RESOURCES INC.

ENGINEER'S STAMP

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