THURBER ENGINEERING LTD.
GEOTECHNICAL ▪ ENVIRONMENTAL ▪ MATERIALS

December 23, 2008 File: 15-16-213

Alberta Transportation
Room 301, Provincial Building
9621 - 96 Avenue
Peace River, Alberta
T8S 1T4

Attention: Mr. Ed Szmata

**PEACE REGION (PEACE – HIGH LEVEL AREA) GEOHAZARD ASSESSMENT**
**HWY 744:04 JUDAH HILL (PH12) HEART RIVER SLIDES**
**2008 ANNUAL INSPECTION REPORT**

Dear Sir:

This letter documents the 2008 annual site inspection of an area of slope instability located along Hwy 744:04 about 2.5 km south of Peace River, Alberta. Thurber Engineering Ltd. (Thurber) undertook this inspection in partial fulfillment of our Geotechnical Services for Geohazard Assessment, Instrumentation Monitoring and Related Work contract (CE105/2008) with Alberta Transportation (TRANS).

Simon Cullum-Kenyon, P.Eng. and Don Proudfoot, P.Eng. of Thurber undertook the inspection on June 2, 2008.

## 1. BACKGROUND

Thurber last visited the site in May 2007 and the site condition at that time is described in our Part B assessment letter in the site binder. Additional information for the site is provided in the Geotechnical File Review in Section A of the binder.

## 2. SITE OBSERVATIONS

The changes in condition since last year are shown on the attached site sketch plan. Selected photographs taken during the visit are also attached.

There are no significant changes to Slide 1, the northern-most slide that had been repaired some years ago (Photo 2). There was significant water noted in the sag pond above the Heart River (Photo 2). There was some water noted in the ditch at the south end of this slide.

Additional movement and failure in the backscarp has occurred at Slide 2 (Photos 4 to 6). The slide has retrogressed slightly (roughly 20 cm) and is now only 2.8 m from the guardrail, but has expanded further to the south. There is ponded water within the fresh debris in the slide bowl.

No significant changes were noted in Slide 3 (Photo 7).

Fresh movement has occurred in Slide 4 since our last inspection in 2007 (Photos 8 and 9), with the backscarp retrogressing by roughly 0.5 m.

No maintenance or repair work has been done since our last visit.

## 3. ASSESSMENT

Surface water drainage appears to be the primary factor driving development of these slides. Slides 2, 3 and 4 are expected to enlarge, with further movement of the unstable blocks on either side of these slides. Enlargement of the slides so far has been primarily through lateral expansion rather than retrogression towards the guardrail. Repair work at slide 1 continues to perform well.

## 4. RISK LEVEL

The risk level for this site has been assessed as follows:

PF(9) * CF(2) = 18

The risk level has remained unchanged from our 2007 assessment. The slides are sufficiently far away from the active road lanes that there are no immediate concerns.

## 5. RECOMMENDATIONS

### 5.1 Short Term

In the short term the site should be regularly inspected by the MCI, particularly after heavy and/or prolonged rain or snowmelt to ensure that the slides haven't

### 5.2 Long Term

Consideration should be given to repair work at Slide No.2 similar to that for Slide No.1. The work could be deferred and the slide observed, but the extent of future repair work will be greater. The repair could be combined with more general improvements to drainage alongside the layby, such as installation of a

French drain, in order to decrease or arrest slide development in this area. With no work, the slides will develop and expand to affect the layby, and ultimately the active lanes, though this may take a number of years, depending on spring runoff and rainfall. Slide No. 2 may start impacting the layby within 1 to 2 years.

The approximate cost for repairing Slide No. 2 is $ 105,000, with installation of a French drain along the ditch estimated to cost another $ 40,000.

Other longer-term measures that might be considered include a pile wall along the entire slope, soil nailing with some form of soil retention system, or re-grading of the whole slope. None of these options is considered warranted at this stage, though might be required in the future if aggressive slide movements occur.

### 5.3 Investigation

No investigation is required at present. If a pile wall or other significant civil works are being considered as a long-term solution, some further investigation will be required.

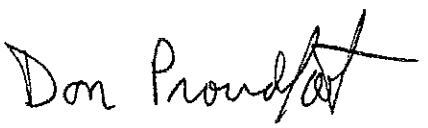
### 5.4 Maintenance

No maintenance items have been identified.

## 6. CLOSURE

We trust this assessment and recommendations meet with your needs at this time. Please contact the undersigned should questions arise or if the slide condition worsens.

Yours very truly,
Thurber Engineering Ltd.
Don Proudfoot, P.Eng.
Review Principal



Simon Cullum-Kenyon, P.Eng.
Project Engineer
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Attachments

cc: Mr. Roger Skirrow, P. Eng.
Director of Geotechnical Services, Alberta Transportation