

GEOHAZARD RISK ASSESSMENT  
CENTRAL REGION

**SITE C55: H861:02 SLIDE**

LEGAL LOCATION: **NW 14-40-14-W4**

REFERENCE LOCATION  
ALONG HIGHWAY: **km 26**

UTM COORDINATES: **N 5811217** **E 437291** (NAD83)

AT FILE: **H861:02**

AT PLAN & PROFILE:

Date of Initial Observation: June 2008

Date of Previous Inspection: June 5, 2009

Inspected By: Klohn Crippen Berger Ltd.

Date of Current Inspection: **June 19, 2012**

Inspected By: Klohn Crippen Berger Ltd.

Instruments Installed: none

Risk Assessment: **PF(9) \* CF(4) = 36**

Last Updated by: Klohn Crippen Berger Ltd.

Date: June 19, 2012

### Location and General Description of Instability

This site is located on Highway 861:02 about 1 km south of the Battle River crossing and about 7 km south of Galahad, Alberta. The slide movement is observed at the crest of a 15 m high slope and was apparent as a 600 mm drop over a 15 m to 20 m length of the gravel road in June 2011. It is understood that the age of the feature is unknown, but it was first visited by KCB in 2008. The slide was initially moving at a slow rate but was apparently re-activated around June 22, 2011 due to the high rainfall levels in the region. Springs are also likely present in the area and the precipitation levels have raised the groundwater levels in the region.

### Geotechnical Conditions

The soil type in the area is consistent with the Horseshoe Canyon Formation and the slope failure is similarly consistent with failures observed in the Drumheller area.

No geotechnical ground investigation has been carried out along the extent of distressed road section.

### Chronology (Refer to Section G for Further Information)

#### **1975**

Site plans from 1975 and current topographic mapping indicate that the highway has likely been realigned since 1975.

#### **July 2008**

The following observations were noted:

- On the north side of the highway, the edge of the road appears to have dropped by about 300 mm over a length of about 15 m.
- No cracking or distress was observed in the highway or the slope; however, the vegetation was relatively dense and may have obscured any slide details on the slope.
- The guardrail has settled with the crest of the slope and is now too low to be an effective safety barrier.
- The slope between the highway and the base of the valley is estimated to be about 3H:1V. The slope was well vegetated with long grass and is estimated to be about 15 m high.
- An interesting vegetation feature (dark green alfalfa) was observed on the slope to the east that resembled a flow slide. The cause of this feature is unknown.

## **June 2011**

The following observations were noted in June 2011:

- On the north side of the highway, the edge of the road appears to have dropped by at least about 600 mm over a length of about 15 m to 20 m. The road has been restored to grade with gravel.
- Cracking and distress was observed in the slope below the highway over a width of about 50 m. A toe bulge was observed at the toe of the slope.
- The guardrail has settled with the crest of the slope and is now too low to be an effective safety barrier.
- The slope between the highway and the base of the valley is estimated to be about 2H:1V. The slope was well vegetated with long grass and is estimated to be about 15 m high.
- About 300 m east of the slide, an instability was observed in the slope above the highway.

## **June 2012**

Since 2011 the slide appears to have progressed further. Cracking and a depression extend across the entire road width. A portion of the westbound lane has slumped and the guardrail is now below road level in the slide area. However, the actual amount of displacement is difficult to determine because the road surface has been continually topped up with gravel to preserve the driving surface. It was suspected that the road surface has dropped by well over 1 m on the north side.

Additional cracking and slumping was also observed on the slope below the road surface. Although the tall vegetation masks some of the cracks, sufficient large cracks and slumps have developed to make walking on the slope in the slide area treacherous. Although the periodic addition of gravel helps to maintain a usable driving surface, it loads the top of the slides and exacerbates movements. A large slide has developed along the edge of the road causing a drop in the roadway over a 15 m to 20 m length of roadway.

A site investigation program, including installation of a slope inclinometer and standpipe piezometer, was recommended to assess the zone and rate of movement before designing a repair for the site.