



**ALBERTA TRANSPORTATION  
LANDSLIDE RISK ASSESSMENT**

**SECTION A: GEOTECHNICAL FILE REVIEW**

**PEACE REGION (PEACE RIVER-HIGH LEVEL AREA)**

**SITE PH 26, (Old PH10, Site #3@km 11.0)**

HIGHWAY CONTROL SECTION	Hwy 726:02, km 11.0
NEAREST LANDMARK:	7 km South of Worsley
LEGAL LOCATION:	SW13-86-8-W6
DATE OF INITIAL OBSERVATION:	2001
DATE OF LAST INSPECTION:	June 2008
LAST INSPECTED BY:	Thurber Engineering Ltd. (TEL)
INSTRUMENTS INSTALLED:	3 Slope Inclinometers and 3 Pneumatic Piezometers (2008)
INSTRUMENTS OPERATIONAL:	2 Slope Inclinometers and 3 Pneumatic Piezometers (2008)
RISK ASSESSMENT:	PF(14) * CF(5) = 70
LAST UPDATED:	Thurber Engineering Ltd., Jan. 2009
PREVIOUS UPDATE:	N/A



## 1. LOCATION

The site is located along Hwy 726:02 about 7 km south of Worsley as shown on Figure 1 attached.

Highway 726:02 crosses the valley of the Eureka River in a north-south direction, following the eastern valley wall north of the River. The valley of the Eureka River is approximately 30 m deep. The centerline of the crossing is at about km 10.91.

Previously, the PH10 Eureka River area encompassed three geohazard sites extending along a 1 km length of this highway on both sides of the box culvert. However, the area has now been subdivided into 2 separate "PH" areas using the culvert as a split, and PH26 now includes only Site #3 located about 100 m north of the culvert.

## 2. GENERAL DESCRIPTION OF SLOPE INSTABILITY

Slope movements have occurred along this section of Highway 726:02 on the north side of the river since at least 2001, when a dip in the highway was observed about 100 m north of the crossing. The slide has since retrogressed across the highway, with the backscarp and dip located in the east shoulder. The slide mass is about 80 m wide by 60 m long, and there is a 15 m elevation difference between the top of the slide and the toe at the river.

During the 2007 annual inspection, a couple of cracks were noticed through an asphalt patch in the highway about 100 m north of the above noted instability (centered at about km 11.1). It appeared more prominent during the 2008 annual inspection, consisting of a 30 m wide dip and patch with cracks at its south extremity.

A third dipped area about 40 m wide with a sunken east highway shoulder and sideslope was observed further north (at about km 11.25) during the 2008 annual inspection.

## 3. PAST INVESTIGATIONS/RESULTS/REMEDIATION

A geotechnical investigation was performed by Thurber in January 2008. It consisted of drilling three (3) test holes along the west side of the highway through the slide mass, installing inclinometers and pneumatic piezometers in each, and performing laboratory index testing. The results/conclusions of this investigation are on-going; however significant movements (of magnitudes up to 140 mm/year) were recorded in October 2008 at two separate base depths in each of the three





inclinometers (extending to 13 m below surface). One of these inclinometers has since sheared off. This information is included in Sections C and D.

#### 4. GEOLOGICAL/GEOTECHNICAL CONDITIONS

The Eureka River is located in a valley north of the Shaftesbury Channel Thalweg. The Alberta Bedrock map (1995) indicates less than 15 m of drift overlying bedrock in this area. Pawlowicz and Fenton (1995) do not report a pre-glacial valley in this area.

Based on information obtained from three 2008 test holes by Thurber located alongside the west edge of the highway, the soil stratigraphy at this site consists of up to 6 m of clay fill, overlying a thin, discontinuous peat layer, overlying high plastic lacustrine clay to a depth of 13 m to 18 m below surface, over clay till which extended to the depths investigated up to 25 m. The groundwater levels varied from 9 m to 10 m below surface in the test holes.

The following map references were searched:

- Physiographic Region - Peace River Lowland.
- Bedrock Geology - Consists of Cretaceous age deposits: predominantly Dunvegan Formation deltaic to marine grey, fine-grained, feldsparitic sandstone, laminated siltstone and grey silty shale.
- Surficial Geology - Located on: Slump/Colluvium, mixed glacial and bedrock materials, mainly along flanks of valleys; but near Lacustrine clay/silt/sand, ranging from poor to well sorted deposits, commonly varved at depth.
- Hydrogeology - Unconsolidated deposits overlying Dunvegan Formation, with yields in the range of 0.1 to 0.4 litres/sec.

#### 5. CHRONOLOGY/REFERENCES

- Jun. 2007 A couple of cracks were noticed through an asphalt patch in the highway centered at about km 11.1.
- Jan. 2008 Thurber Engineering performed a geotechnical investigation in January, 2008 north of the river at PH26. Three test holes were drilled west of the highway through the slide mass to depths of 20 m to 25 m, and consisted of installing inclinometers and pneumatic piezometers at each location, and performing laboratory index testing.



Jun. 2008 The cracks at km 11.1 appeared more prominent during the 2008 annual inspection, consisting of a 30 m wide dip and patch with cracks at its south extremity. A third dipped area about 40 m wide with a sunken east highway shoulder and sideslope was observed further north (at about km 11.25).

**NOTE:** There was no information newer than 1988 available for viewing at TRANS Twin Atria office during this file review (May 28, 2008).