

GEOHAZARD ASSESSMENT PROGRAM
NORTH CENTRAL REGION – ATHABASCA

**Government
of Alberta** ■
Transportation

2009 INSPECTION



Site Number	Location	Name	Hwy	km
NC X	6.5 km west of the junction between Hwy 881 and 858 to the north of Lac La Biche	NORTH OF LAC LA BICHE	858:02	45.85
Legal Description		UTM Co-ordinates (NAD 83)		
NW- 30-68-13-W4M		12 N 6085029	E 436771	

	Date	PF	CF	Total
Previous Inspection:	Sep. 18, 2008	9	2	18
Current Inspection:	June 22, 2009	10	3	30
Road AADT:	360		Year:	2008
Inspected By:	Tarek Abdelaziz, Don Proudfoot (Thurber) Roger Skirrow, Arthur Kavulok, Jake Knudslein (TRANS)			
Report Attachments:	☒ Photographs ☒ Plans ☐ Maintenance Items			

Primary Site Issue:	An active landslide occurred after a heavy rainfall event, causing severe pavement distress on the eastbound lane of the highway	
Dimensions:	About 65 m along the highway and 22 m perpendicular to the highway centerline	
Date of any remediation:	None	
Maintenance:	Highway patched in Fall 2006, Fall 2007, May 2008, September 2008, September 2009 (after June, 2009 site visit), and probably in October 2009 according to recent correspondence with TRANS.	
Observations:	Description	Worse?
☒ Pavement Distress	New pavement overlay on the highway eastbound and westbound lanes. Up to 15 mm wide cracks on the EBL. 5-10 mm wide cracks on the WBL. 5 mm dip noted on the EBL at the western limit of the slide	☒
☒ Slope Movement	Distortion of the fence and the muskeg ditch on the south side of the highway since 2008; graben counterscarp crack width has increased by 125 mm since 2008 visit; titling trees by the fence	☒
☐ Erosion		☐
☒ Seepage	Water ponding in the ditch between the toe of the south side slope and the graben counterscarp crack	☐
☐ Bridge/Culvert Distress		☐
☒ Other	The beaver dams located further to the east of the highway were cleared to enhance the surface drainage at the site	☐
Instrumentation: None		

Assessment (Refer to attached Figure):

The site conditions appeared to have deteriorated due to the continued slide movement. This is evident from re-opening of cracks on highway, the severe distortion along the muskeg ditch, the fence, and widening of the graben counterscarp crack by additional 125 mm since last year, which are all indicative of the accelerated movement of the lower slide block. The infiltration of surface water (trapped in the highway ditch) into the open graben counterscarp crack probably contributed to movement acceleration. The appearance of new cracks on the WBL reflects the tendency of the slide to retrogress to the WBL of the highway. The site features indicate that the slide is probably a shallow translational landslide extending to the south of the fence.

Recommendations:

According to recent correspondence with Mr. Kavulok in November 2009, the highway conditions deteriorated significantly after the site visit and the highway was re-patched in September, 2009. However, severe cracking and pavement distress were noted on the EBL in October 2009. It is understood that re-patching the highway was planned for November 2009.

In the short term, the MCI should continue to seal any open cracks on the highway surface and re-patch the highway as required to improve the quality of ride to a minimum level. Smoothing out the ditch and filling the graben counterscarp crack is important to enhance surface drainage and reduce the likelihood of further surface water infiltration into the crack. It is also recommended to undertake a geotechnical investigation program (consisting of installing 2SIs and 2PNs, preliminary survey and slope stability analyses) to understand subsurface and ground water conditions, and explore potential remedial measures.

After the implementation of the geotechnical investigation program, possible long term remedial measures might include either of the following:

- (1) Excavation and Replacement of slide mass at a ball park cost of \$750,000, excluding land acquisition. This will require some slope flattening, gravel fill for drainage, and a shear key.
- (2) Construction of a toe berm at a ball park cost of \$500,000, excluding land acquisition.
- (3) Construction of a pile wall at a ball park cost of \$700,000.

Improvements to surface drainage are likely required with each of the above options.