

SITE NUMBER AND NAME: S028 Slide East of Lundbreck Falls		HIGHWAY & KM: 3A:06, 2.367	PREVIOUS INSPECTION DATE: May 10, 2019	INSPECTION DATE: May 20, 2022
LEGAL DESCRIPTION: 06/07-27-007-02 W5M	NAD 83 COORDINATES: UTM Northing Easting 11 5496507 702877		RISK ASSESMENT: PF: 9 CF: 4 TOTAL: 36	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 190 (east) & 230 (west), (Reference No. 75050 & 75060)			CONTRACTOR MAINTENANCE AREA (CMA): 26	

SUMMARY OF SITE INSTRUMENTATION: Piezometers: Two operable pneumatic piezometers Slope inclinometers: None operable LAST READING DATE: May 2019 – instruments are not being read under the current contract	INSPECTED BY: Chris Morgan (KCB) Laura Assaad (KCB) Alex Frotten (AT) Roger Skirrow (AT)
PRIMARY SITE ISSUE: Landslide approximately 6 m to 12 m deep, seated in bedrock above Crowsnest River	
APPROXIMATE DIMENSIONS: Slide impacts approximately 100 m of highway, slope is approximately 15° to 20° and approximately 30 m high above river.	
DATE OF ANY REMEDIAL ACTION: Unknown – on the landslide, a 450-mm diameter CSP with holes punched in it appears to function as a subsurface drain that discharges into a 750-mm diameter oversized CSP slope drain. 2020 – the site was resurfaced due to pavement cracking and settlement	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Cracks and settlement of pavement surface due to back scarp of slide extending to centreline. Longitudinal and transverse cracks have formed on the recently resurfaced highway.	X	
Slope Movement	X		Ongoing movement and deformation below guardrail.		X
Erosion		X	N/A – none observed		X
Seepage		X	N/A – none observed		X
Culvert Distress		X	Culverts were not inspected during the 2022 inspection		X

COMMENTS
The slide appears active due to the ongoing pavement cracking observed in the highway surface.
Highway 3A:06 is a minor road with a low traffic volume. The highway has viable detour options if the road condition deteriorates to the point where the highway would need to be closed.
The highway was resurfaced in summer 2020. It appears as though sections of the guardrail were replaced during the highway resurfacing project.
During the 2022 site visit, new transverse and longitudinal pavement cracks were observed through the new pavement surface due to continued landslide movements. The pavement cracking pattern was similar to the pavement cracking observed prior to summer 2020 (Photos 1 and 2).

The culvert underlying the Canadian Pacific Rail (CPR) line drains into a riprap lined "pit" upslope of the highway. The riprap lined pit is upslope of the slide zone and does not have an outlet. Water discharged from the culvert appears to infiltrate into the underlying soils, which could potentially increase the groundwater table and destabilize the slope.

The inlet to the 450-mm diameter CSP slope drain was not located in the upslope ditch of the highway. However, the culvert outlet has several holes punched in it near ground surface, which could indicate that the culvert was installed as a subsurface drain, not a conduit to convey ditch flow through the slide area.

Maintenance/Repair/Monitoring Recommendations:

- Inspections should be completed by the MCI and every two-years as part of the Southern Region GRMP Section B inspections. Hwy 3A is a low traffic road and, as long as slide movements are slow, continued patching and maintenance could address pavement roughness concerns.
- The guardrail is low in several locations and could be raised to a more suitable height.
- The slide could be repaired with:
 - Slope reconstruction with geosynthetic reinforced gravel, including either a shear key or pile wall extending to below historic zones of movement; and
 - Improved subsurface drainage (drainage trenches or buried subsurface drains). Surface water drainage should be improved along the highway to minimize infiltration into the slide zone.

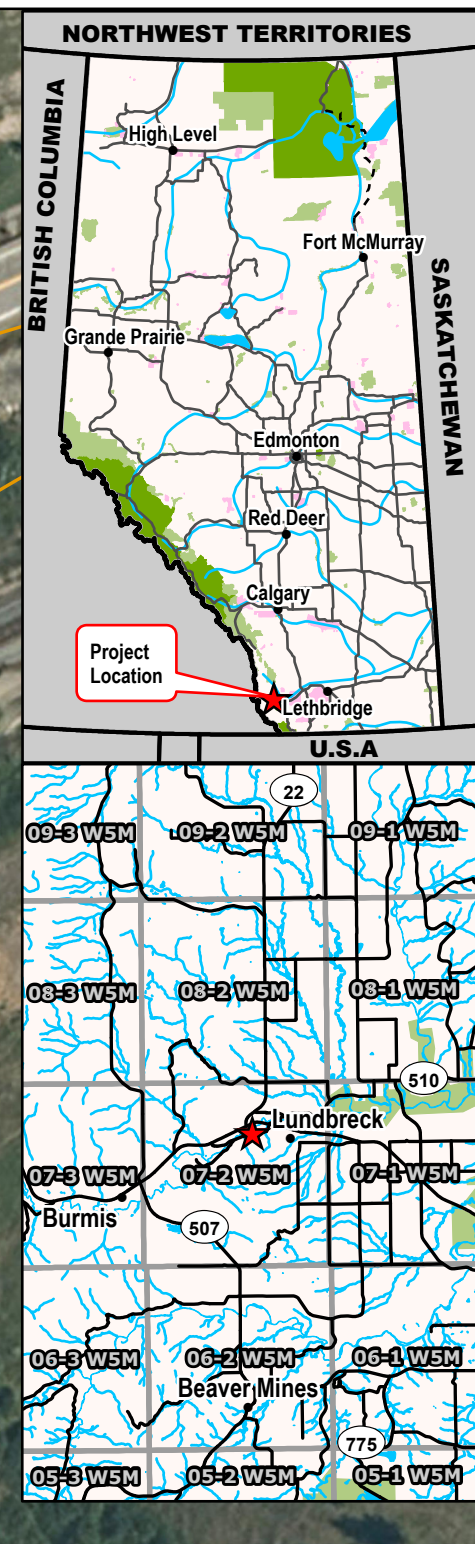
This report is an instrument of service of Klohn Crippen Berger (KCB). The report has been prepared for the exclusive use of Alberta Transportation (Client) for the specific application to the Southern Region Geohazard Risk Management Program (Contract No. CON0022161) and it may not be relied upon by any other party without KCB's written consent.

KCB has prepared this report in a manner consistent with the level of care, skill and diligence ordinarily provided by members of the same profession for projects of a similar nature at the time and place the services were rendered. KCB makes no warranty, express or implied.

Use of or reliance upon this instrument of service by the Client is subject to the following conditions:

- (i) The report is to be read in full, with sections or parts of the report relied upon in the context of the whole report.
- (ii) The observations, findings and conclusions in this report are based on observed factual data and conditions that existed at the time of the work and should not be relied upon to precisely represent conditions at any other time.
- (iii) The report is based on information provided to KCB by the Client or by other parties on behalf of the client (Client-supplied information). KCB has not verified the correctness or accuracy of such information and makes no representations regarding its correctness or accuracy. KCB shall not be responsible to the Client for the consequences of any error or omission contained in Client-supplied information.
- (iv) KCB should be consulted regarding the interpretation or application of the findings and recommendations in the report.
- (v) This report is electronically signed and sealed and its electronic form is considered the original. A printed version of the original can be relied upon as a true copy when supplied by the author or when printed from its original electronic file.

<p>Chris Gräpel, M.Eng., P.Eng. Senior Civil Engineer, Associate</p>	
--	--



Legend

- ◆ Pneumatic Piezometer
- GPS Track (May 20, 2022)
- ~ Cracks (Approximate Location)
- 750 mm CSP Slope Drain (Approximate Location)
- - - Possible Extent of Slide Area
- Culvert

NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM ZONE 11N
 3. IMAGE SOURCE: MD OF WILLOW CREEK NO. 26, TOWN OF PINCHER CREEK, WILLOW CREEK, MAXAR

CLIENT

Alberta

Klohn Crippen Berger

PROJECT SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM		
TITLE Site Plan S028 - Slide East of Lundbreck Falls Hwy 3A:06, km 2.367		
SCALE 1:1,000	PROJECT No. A05116A03	FIG No. 1

Inspection Photographs

- Photo 1** Longitudinal and transverse cracks visible through the 2020 pavement patch in the right flank of landslide zone. Section of the guardrail (indicated by red arrow) were replaced between the 2019 and 2022 inspections. Photo taken May 20, 2022, facing northeast.



- Photo 2** Longitudinal and transverse cracks visible through the 2020 pavement patch in the left flank of landslide zone. Photo taken May 20, 2022, facing southwest.

