

SITE NUMBER AND NAME: <b>S028 Slide East of Lundbreck Falls</b>		HIGHWAY & KM: 3A:06, 2.367	PREVIOUS INSPECTION DATE: June 1, 2017	INSPECTION DATE: <b>May 10, 2019</b>
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), (Ref No. 75050, 75060)			CONTRACTOR MAINTENANCE AREA (CMA): 26	

SUMMARY OF SITE INSTRUMENTATION:  Piezometer: 2 pneumatic piezometers Slope inclinometers: None functioning  LAST READING DATE: May 2019		INSPECTED BY: Chris Gräpel (KCB) Chris Morgan (KCB) Roger Skirrow (AT) Alex Frotten (AT) Nicolas Ropchan (AT)
PRIMARY SITE ISSUE: Landslide approximately 6 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: None recent aside from patching approximately 3 years ago. 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, but the date of installation is unknown.		

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. Cracks sealed in the past have separated, indicating ongoing movement. Pavement surface has sunk compared to 2017.	X	
Slope Movement	X		Ongoing movement and deformation below guard rail.		X
Erosion		X			X
Seepage		X	None observed		X
Culvert Distress		X			X

<b>COMMENTS</b>
Ongoing slope movement. Hwy 3A is a minor road with detour options if the road condition deteriorates. Visit every 2 years as part of GRMP tour.
Cracking on asphalt surface within historic slide area have been sealed in the last 3 years. Continued movements have separated the crack sealant, exposing open cracks below. Review of historic inspection photos indicate cracking at the main slide area has not increased appreciably since 2015. Some open cracks are up to 3 cm wide.
The CP Rail embankment slope above the S028 site appears to have been regraded, possibly due to a derailment.
Drainage from CPR culvert to southwest of highway drains into a "pit" upslope of the highway at the slide location with no outlet. Water discharged from the CPR culvert appears to infiltrate into soils below pit, upslope of the slide

zone.

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

AT pavement LiDAR collected over several years (5 to 10 years) should be reviewed along with patching and overlay records to assess impact of slope movements on highway surface and to estimate rate of movement of asphalt surface.

Candidate repair options include:

- 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.

It is recommended that sharp pavement crack edges are milled off for safety and comfort of road users.

**Photo 1** East flank of landslide zone. Note crack sealing on pavement. Photo taken facing northeast on May 10, 2019.

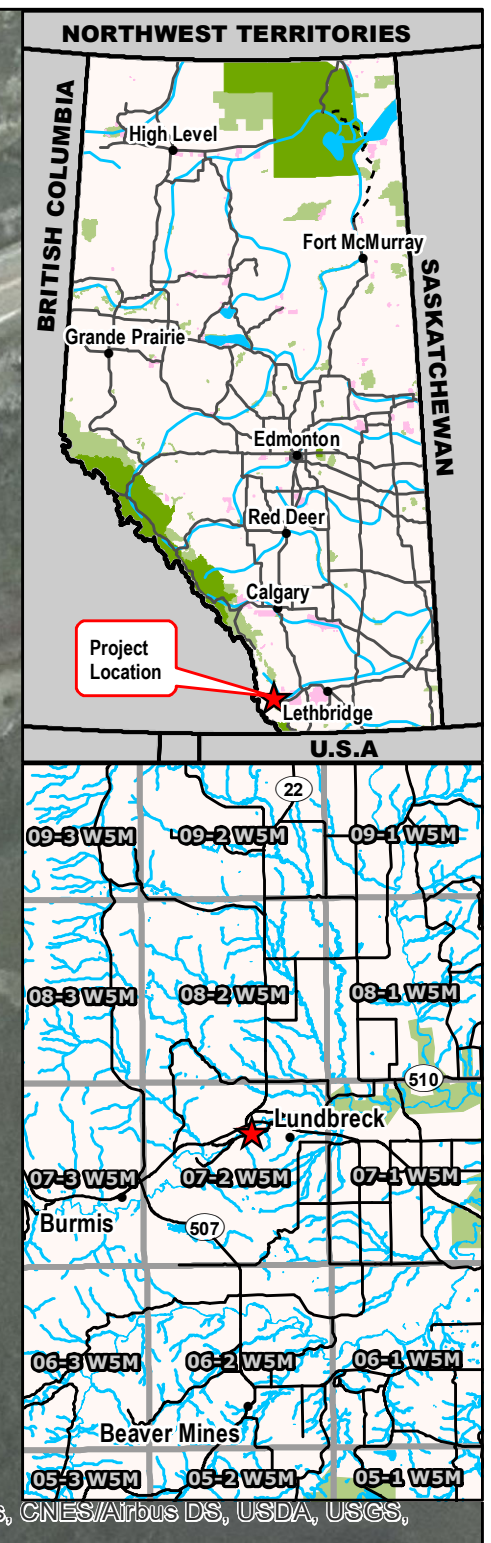


**Photo 2** West flank of landslide zone. Note crack sealing on pavement. Photo taken facing southwest on May 10, 2019.



**Photo 3** CP Rail embankment upslope of the slide. Photo taken facing southwest on May 10, 2019.





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,

**Legend**

- ◆ Pneumatic Piezometer
- 750 mm CSP Slope Drain (Approximate Location)
- Outlet of 750 mm diameter CSP slope drain
- - - Possible Extent of Slide Area
- ~ Cracks (Approximate Location)
- Culvert



NOTES:  
 1. HORIZONTAL DATUM: NAD83  
 2. GRID ZONE: UTM Zone 11N  
 3. IMAGE SOURCE: World Imagery, ArcGIS Online.  
 Southern Alberta 2015 Imagery

CLIENT




PROJECT	SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM	
TITLE	Site Plan S028 - Slide East of Lundbreck Falls Hwy 3A:06, km 2.367	
SCALE	PROJECT No.	FIG No.
1:1,000	A05115A03	1

Time: 17:08:16 PM  
 Date: June 13, 2019  
 File: Z:\A\EDM\A05115A03 ABT Southern Region GRMP\A00 Drawings\2019\2. Section BIM\XDS\08\_190613.mxd