

SITE NUMBER AND NAME: S056-I West Gorge Creek, West of Turner Valley		HIGHWAY & KM: Sheep River Road	PREVIOUS INSPECTION DATE: June 8, 2020	INSPECTION DATE: July 5, 2021
LEGAL DESCRIPTION: 15-29-019-05 W5M	NAD 83 COORDINATES: UTM Northing Easting 11 5612799 665797		RISK ASSESSMENT: PF: 13 CF: 10 TOTAL: 130	
MONTHLY AVERAGE DAILY TRAFFIC (MADT): May 2020 390 (west), 382 (east). (Ref. No. 55460220)			CONTRACTOR MAINTENANCE AREA (CMA): 27	

SUMMARY OF SITE INSTRUMENTATION: None LAST READING DATE: N/A	INSPECTED BY: Chris Morgan (KCB) Chris Grapel (KCB) Alex Frotten (AT) Roger Skirrow (AT)
PRIMARY SITE ISSUE: Slope failure on the south side of the highway due to surface runoff erosion and groundwater. The highway is located at the crest of a steep valley slope above Sheep Creek River. The southern ditch has been undermined and is draining directly into the slide zone. Head scarp approximately 0.2 m from highway surface and is undermining the guard rail.	
APPROXIMATE DIMENSIONS: Head scarp is approximately 15 m wide at the crest of a 40 to 50 m high slope above the Sheep River. Approximately 1/3 of the way down the slope, the failure area narrows to a 3 to 5 m wide erosion gully.	
DATE OF ANY REMEDIAL ACTION: None	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress		X	Backscarp has started to undermine the pavement		X
Slope Movement	X		Slope failure due to ongoing surface runoff erosion		X
Erosion	X		Slope erosion due to ditch runoff into slide area	X	
Seepage	X		Groundwater seepage observed approximately 6 m down the slope, near the rock ledge	X	
Culvert Distress		X			X

COMMENTS
Steep slope at approximately 2H:1V, with no vegetative cover in the slide area. The highway ditch on the west flank of the slide is draining directly onto the slide area. The slope failure will continue to encroach on the highway surface and guard rail with continued erosion due to the ditch discharge.
When compared to 2020 observations, the slope failure has continued to expand to the west (uphill) and vegetation is falling into the erosion feature. In addition to expanding westwards, the overall slope of the erosion feature is flattening in the upper section as the feature deepens and ongoing erosion continues to remove sediment. Erosion has exposed a sedimentary rock ledge on the west side.
The back scarp has retrogressed to within 0.2 m of the highway and the guardrail continues to be undermined. A plastic jersey barrier has been placed north of the guard rail to protect road users. No deflection of the barrier was noted.

Tension cracking and slumping was observed on the left (east) flank of the slope failure in 2020. The ground surface had dropped by up to 0.15 m and is expected to eventually slide into the erosion feature, enlarging the disturbed area. There is one fallen sapling but overall, there was no significant change observed in this area when compared to 2020 observations.

Slope erosion is depositing an alluvial fan in the Sheep River.

The ongoing toe erosion from the river and surface water runoff from the highway are causing the erosion feature to enlarge and will eventually lead to undermining of the pavement, surface cracking and a dip that will require extensive repairs, including a possible shift of the road to the north.

Candidate repair options include:

- Diversion of the south ditch to the north side of the highway with a cross culvert;
- Relocation of the highway north, possibly including steepening of the north slope, and improvements to surface water drainage; or
- Repair of the erosion gully using a geogrid reinforced embankment, a timber crib wall, a lock block retaining wall, or a gabion basket wall. A stable foundation will be needed to provide a working surface for construction.

A drilling program should be carried out to determine design parameters.

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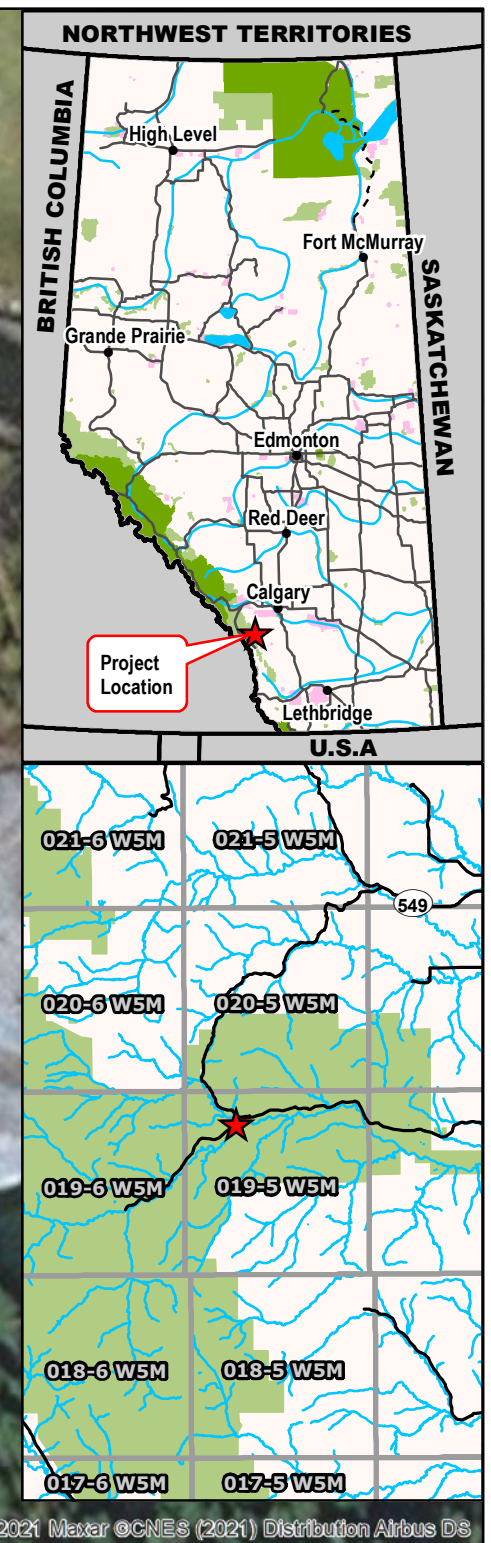
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- (i) The report is to be read in full, with sections or parts of the report relied upon in the context of the whole report.
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- (iii) KCB should be consulted regarding the interpretation or application of the findings and recommendations in the report.



2021-11-24

Chris Morgan, M.Sc., P.Eng.
Senior Geotechnical Engineer



Undermined guardrail

Slope instability due to enlargement of the erosion gully

Alluvial fan forming at the toe of the slope due to surface erosion.

Sheep River



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- Legend**
- Main Scarp
 - Flow Direction



NOTES: 1. HORIZONTAL DATUM: NAD83 2. GRID ZONE: UTM Zone 11N 3. IMAGE SOURCE: Bing Maps 2020, Microsoft Corporation.	CLIENT 	PROJECT SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM
		TITLE Site Plan S056-I West Gorge Creek Site I Sheep River Road
SCALE 1:1,000	PROJECT No. A05116A03	FIG No. 1

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 Date: October 07, 2021
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Photo 1 Head scarp on south side of Sheep River Road. Photo taken facing east on July 5, 2021.



Photo 2 View from highway down the erosion gully. An alluvial fan is forming in the Sheep River due to erosion. Photo taken facing southeast on July 5, 2021.



Photo 3 Ditch draining into failure area from the west. A bush has fallen into the erosion feature since 2020 (red circle). Photo taken facing west on July 5, 2021.



Photo 4 Slumping of the bank on the left flank due to ongoing erosion. Photo taken facing northwest on July 5, 2021.

