

<b>SITE NUMBER AND NAME:</b> NC076 – Blue Ridge Slide	<b>HIGHWAY AND KM:</b> 658:02, km 7.417	<b>PREVIOUS INSPECTION:</b> May 25, 2020	<b>CURRENT INSPECTION:</b> May 31, 2023
<b>LEGAL DESCRIPTION:</b> SW 25-59-10-W5M and SE 26-59-10-W5M	<b>NAD83 COORDINATES:</b> UTM11U 5999049N, 606082E		<b>RISK ASSESSMENT:</b> PF: 4 CF: 6 Total: 24
<b>AVERAGE ANNUAL DAILY TRAFFIC (AADT):</b> 870 (2022)		<b>CONTRACTOR MAINTENANCE AREA (CMA):</b> 508	

<b>SUMMARY OF INSTRUMENTATION:</b> Three slope inclinometers (SI) functional.  <b>LAST READING DATE:</b> May 15, 2023	<b>INSPECTED BY:</b> Stantec: Leslie Cho and Sonja Pharand TEC: Rocky Wang, Amy Driessen and Dean Kokotyn
<b>PRIMARY SITE ISSUE:</b> Slope instability during and following culvert replacement in 2009. Culvert distress and pavement cracking.	
<b>APPROXIMATE DIMENSIONS:</b> 110 m wide x 65 m long	
<b>DATE OF ANY REMEDIAL ACTION:</b> Culvert replacement in 2009. Asphalt patching in 2011. Asphalt patching in 2015 due to sudden vertical movement. Berm and drain construction began October 2018 and finished July 2019. Pavement patched between Spring 2020 and Spring 2023.	


ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICEABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Cracking at access to residence at north limit. Cracking upslope from SIs, to the north of the culvert crossing.	X	
Slope Movement	X		Skin slides south of culvert inlet.		X
Erosion	X		Erosion gullyng on the east side of the highway, starting at pavement edge. Erosion gullyng in the east swale leading to the culvert inlet and on the north side of the culvert inlet. Erosion gullyng in the west swale leading to the culvert outlet.	X	
Seepage		X			X
Bridge/Culvert Distress		X			X

<b>COMMENTS</b>
<ul style="list-style-type: none"> <li>Pavement cracking at the entrance to the residence at the north site limits appears unchanged since 2018 (Photo 1).</li> <li>The pavement was patched across both lanes from the north end of the guardrail to approximately 125 m south. Cracks have begun to develop within the repaired area and are forming a semi-circle within the SBL upslope from SI19-01 and SI19-02 (Photo 2).</li> <li>The subdrains at the culvert outlet were not observed and are likely grown over with vegetation.</li> <li>The extended portion of the culvert outlet appears to be in good condition (Photo 3).</li> <li>Gullyng with ponded water was observed in the swale next to the tree line on the west slope, south from the culvert outlet (Photo 4).</li> </ul>

- Erosion gullies up to 1.2 m deep and 2.3 m wide were observed on the east side of the highway leading to the culvert inlet (Photos 6 and 7).
- Erosion gullies up to 0.4 m wide were observed on the east side of the highway, starting at the pavement's edge near the culvert inlet.
- Skin slides were observed on the slope to the south of the culvert inlet but appear to be establishing vegetation cover (Photo 8).
- SI19-01 and SI19-02 currently have a movement rate of less than 1 mm/yr with cumulative movement of less than 1 mm since 2019. However, SI19-03 installed on the lower portion of the embankment slope currently has a movement rate of 1 mm/yr at a depth of about 7 m below ground surface with total cumulative movement of nearly 6 mm.

**RECOMMENDATIONS**

- Pavement cracks should be sealed to reduce surface water infiltration into the embankment.
- Regrading of the drainage ditches along the east and west embankment slopes could be completed.
- Site inspections should continue to be completed once per contract cycle.
- Instrument monitoring should continue to be completed annually in the spring.

<b>PREPARED BY:</b> Sonja Pharand, P.Eng.	<b>PREPARED BY:</b> Leslie Cho, M.Eng., P.Eng.
	
<b>REVIEWED BY:</b> Xiteng Liu, M.Sc., P.Eng., PMP	<b>PERMIT TO PRACTICE</b>

2023 Site Inspection Photos at NC076



**Photo 1:** Pavement cracks at north portion of site at road to residence. Looking southwest.



**Photo 2:** Pavement cracks upslope from SI19-01. Looking northeast.

2023 Site Inspection Photos at NC076



**Photo 3:** Culvert outlet, looking southeast.



**Photo 4:** Gullying and ponded water present through swale leading to culvert outlet. Looking southeast.

2023 Site Inspection Photos at NC076



**Photo 5:** Repaired slope and berm location. Looking northwest.



**Photo 6:** Erosion gully in the east ditch, north from culvert inlet. Looking east.

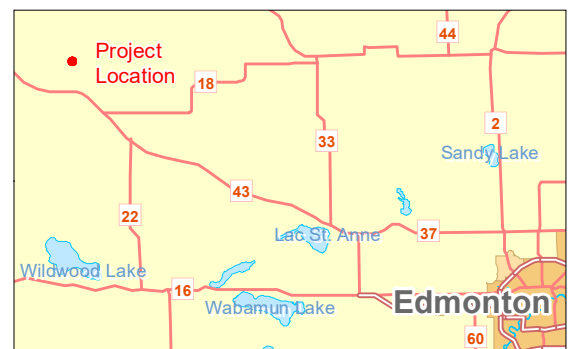
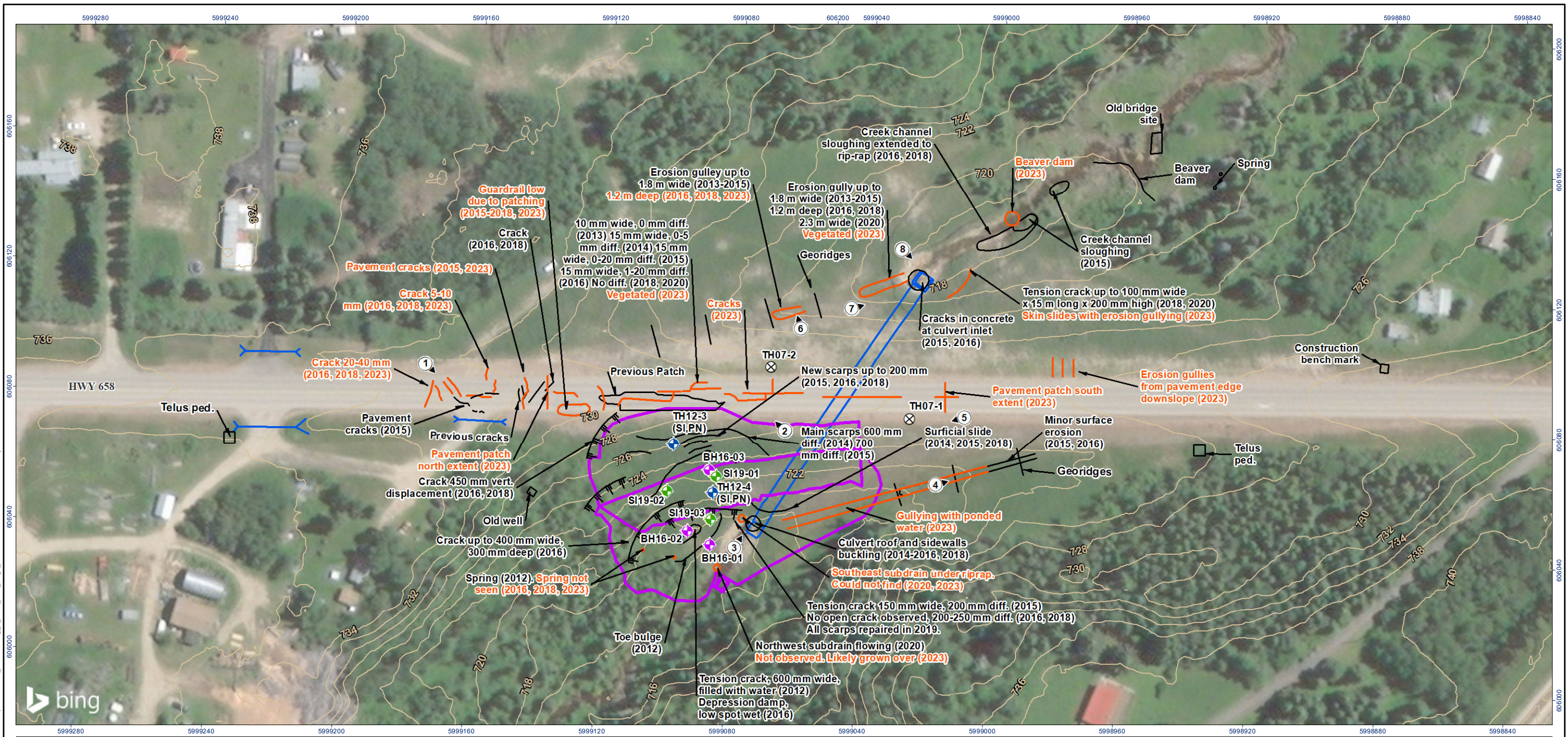
2023 Site Inspection Photos at NC076



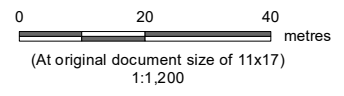
**Photo 7:** Erosion upslope from culvert inlet. Looking north.



**Photo 8:** Skin slides south of culvert inlet. Looking southwest.



- Photo Number and Direction
- Testhole (Others, 2007)
- Slope Inclinerometer Location (Thurber, 2012)
- Monitoring Well (Stantec, 2016)
- Slope Inclinerometer Location (Stantec, 2019)
- Previous Observation
- 2023 Observation
- Culvert
- Embankment Footprint (approx.)
- Ground Elevation Contours (m AMSL, LiDAR July 2006)



Project Location: Blue Ridge, Alberta  
 Prepared by MK on 2023-07-20  
 Quality Review by LC on 2023-08-23  
 Independent Review by XL on 2023-08-25

Client/Project: Transportation and Economic Corridors, Geohazard Monitoring Program, NC76 Blue Ridge Slide  
 123315222

Figure No. 1

Title: Site Plan

Notes  
 1. Coordinate System: NAD 1983 UTM Zone 11N  
 2. Data Sources: Geogratis, ©Department of Natural Resources Canada, All rights reserved.  
 3. Background: © 2023 Microsoft Corporation © 2023 Maxar ©CNES (2023) Distribution Airbus DS