

## ALBERTA TRANSPORTATION GEOHAZARD ASSESSMENT PROGRAM PEACE REGION – PEACE-HIGH LEVEL 2020 INSPECTION

Site Number	Location	Name	Hwy	km	
PH61	East Hill	36+180 to 37+130 Site 4	2:60	36.7	
Legal Description		UTM Co-ordinates			
NW & E29-083-21	W5M	11V E 482790	N 623175	55	

	Date	PF	CF	Total
Previous Inspection:				
Site 4 Upslope	3-Jun-2019	2	5	10
Shallow slide 37+050	3-Jun-2019	8	4	32
Shallow slide elephant	3-Jun-2019	7	3	21
trunk 36+500				
Current Inspection:				
Site 4 Upslope	9-Jun-2020	2	5	10
Shallow slide 37+050	9-Jun-2020	8	4	32
Shallow slide elephant	9-Jun-2020	7	3	21
trunk 36+500				
Road WAADT:	4580		Year:	2019
Inspected By:	Ed Szmata, TRANS		Don Proudfoot, TEL	
	Rocky Wang, TRANS		Tyler Clay, TEL	
Report Attachments:	Photographs			
	✓ Plans ✓ Maintenance Items		e Items	

Primary Site Issue:	Large landslide (Site 4) on south side of Grouard bridge prevencompassed highway in 1980s. Mitigated upslope area by crest unloading. Local gullying and erosion mainly on the side of east approach embankment of Grouard bridge. Slinstabilities of fill slope of roadway/cutslope to adjacer railway. Previous major gully erosion issues from elephant discharging midslope at 36+450; mitigated in 2007 construction of new elephant trunk drain. Earth flow occur Spring 2016 at base of gully at 36+230 that encroached in Heart River (Photo 61-06). Slope grading and concrete draswales were constructed at the bridge and within the dia 2017/2018.	
Dimensions:	Site 4 landslide is 200 m wide; extends 150 m upslope of roadway. CN rail line runs parallel (30 m horizontal) from roadway on downslope side. Earth flow at 36+230 is located 85 m downslope of highway and is approximately 30 m wide (widest point at the main gully head) and 100 m long.	
Maintenance:	Minor maintenance on the east approach embankment of Grouard bridge in 2014. No other maintenance activity since 2011.	
Observations:	Description	Worsened?
☐ Pavement Distress		

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✓ Slope Movement	Shallow slide 10 m downslope of road embankment at 36+350 appears to have ongoing movement but no visible change since 2019 (Photo 61-01).  Upslope of Site 4 landslide continues to appear inactive. Shallow slump on CN cutslope just below roadway at 37+050 remains similar to conditions observed in 2019. No major changes since 2012.  No changes observed in the shallow slump area within the fill material on north side of Elephant Trunk (first observed in 2012).			
☑ Erosion	Active erosion and slumping continue within gully downslope of culvert at 36+230. Gullying at 36+470 is ongoing and slightly deeper but has not visibly expanded laterally along the road (Photo 61-02). Erosion within southeast side of Grouard Bridge abutment slope (37+050). Road runoff in this area is draining over the pavement edge before reaching the swale due to sand and gravel buildup at the edge. (Photo 61-04). Surface erosion is similar to the previous inspection on the steep bedrock-controlled portion of lower slope along Elephant Trunk drain with increased vegetation growth (Photo 61-06). Active ditch erosion is occurring on northeast side of the Grouard Bridge (37+125) (Photo 61-05).	<u>\</u>		
□ Seepage				
☐ Bridge/Culvert Distress				
✓ Other	Trunk drain outlet structure was intact and functioning as intended (Photo 61-03).			
Instrumentation:  SI-06 – No discernible movement. SI-99 – No discernible movement. SI-105 – No discernible movement.				

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## **Assessment:**

Small deep-seated movements are occurring along roadway in vicinity of Site 4. These rates of movements are small and/or intermittently active and do not appear to pose any immediate threat unless they begin accelerating.

Shallow slide at 36+350 could impact edge of road as the main scarp retrogresses and/or erodes. Active slide/earth flow area at the base of the slope below the gully does not pose immediate hazard to the highway but could cause retrogressive instability further upslope in the future.

Consideration may need to be given to diverting ditch flow around 36+200 to existing trunk drain or building new trunk drain to reduce gully expansion below roadway.

Grading and addition of concrete swale structures are expected to reduce rate of erosion at the bridge abutments from surface runoff. The sand and gravel buildup at the edge of the highway will need to be regularly cleaned to ensure water runoff is not blocked from entering the swale inlets. Consideration should be given to building an asphalt berm to ensure runoff is directed to the swale.

Recommendations:	Cost
Remove buildup of sand and gravel at the pavement edges around Grouard Bridge embankments. Ditch grading required around Grouard Bridge.	Maintenance
Continue to monitor instruments twice yearly and undertake annual inspections.	-
Mitigation measures (such as excavation of slide material and replacement with gravel backfill) should be developed and implemented for the shallow slide on west side of elephant trunk at 36+450 and downslope shoulder at 36+350 to minimize potential retrogression into the highway.	\$350,000
Mitigation measures may be required to repair the culvert at 36+230.	\$450,000

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