



**NORTH CENTRAL REGION GRMP  
EDSON / STONY PLAIN  
SITE INSPECTION FORM**



<b>SITE NUMBER AND NAME:</b> NC011 – 5.5 km North of Highway 16 (Near Hinton)	<b>HIGHWAY AND KM:</b> 40:30, km 5.617	<b>PREVIOUS INSPECTION:</b> May 26, 2020	<b>CURRENT INSPECTION:</b> July 15, 2021
<b>LEGAL DESCRIPTION:</b> NW-01-51-26-W5	<b>NAD83 COORDINATES:</b> UTM11U 5914110N, 452891E		<b>RISK ASSESSMENT:</b> PF: 13 CF: 8 Total: 104
<b>AVERAGE ANNUAL DAILY TRAFFIC (AADT):</b> 1,260 (2020)		<b>CONTRACTOR MAINTENANCE AREA (CMA):</b> 508	

<b>SUMMARY OF INSTRUMENTATION:</b> Two slope inclinometers functional	<b>INSPECTED BY:</b> Stantec: Leslie Cho and Carrie Murray AT: Bernard Ching, Rishi Adhikari, Kathleen Davis, Howard Hawley, and Dave Farr
<b>LAST READING DATE:</b> July 3, 2021	
<b>PRIMARY SITE ISSUE:</b> Slope movement of a sidehill cut-fill section downslope of highway.	
<b>APPROXIMATE DIMENSIONS:</b> Highway crack near SI4 is about 45 m long. The location of toe is unclear. Scarp along south shoulder of highway about 110 m wide x 10 m long. Active landslide movement downslope of south shoulder scarp about 90 m wide by 50 m long.	
<b>DATE OF ANY REMEDIAL ACTION:</b> Highway spray patched in 2009.	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICEABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Pavement cracks with vertical difference near SI4.		X
Slope Movement	X		Pavement cracking with 30 mm to 40 mm vertical difference at west portion of site. Ground cracks, heaving, and bulging at about midslope below south shoulder scarp and approximately 120 m northeast of SI2. Progression of the east midslope landslide with leaning trees, open scarps and a graben observed. Ground crack at base of embankment about 1.9 m south of guardrail near "Hinton Entrance" sign.	X	
Erosion	X		Erosion rills on highway backslope and erosion channel in backslope ditch. Concentrated surface flow/gully through east and west midslope landslides.		X
Seepage	X		Two seepage locations at midslope landslide below the south shoulder scarp.		X
Bridge/Culvert Distress		X			

<b>COMMENTS</b>	
<ul style="list-style-type: none"> <li>• Site plan Figure 1, cross section Figure 2 and a photo log are attached for reference.</li> <li>• The previously observed pavement cracks were filled with sand. Crack dimensions were up to 250 mm wide with 30 mm to 40 mm vertical difference. Pavement cracks are shown on Photos 1 to 3.</li> <li>• SI4 has not shown discernable movement since initialization in 2009 suggesting slope movements are limited to the highway surface, particularly the eastbound lane (EBL).</li> <li>• SI2 showed less than 1 mm of incremental movement between Fall 2020 and Spring 2021. Comparatively, in 2019, about 6 mm of incremental movement was measured.</li> <li>• The west midslope landslide movement located downslope from the access bench appeared to have retrogressed upslope. Two successive scarps were observed on the east portion. The main scarp was about 4 m to 5 m high followed by a second scarp about 1.5 m high. Wet soil was observed at the base of the 1.5 m high scarp (Photo 4).</li> <li>• A 35 m long ridge/graben feature about 600 mm high was observed at the west extent of the east midslope landslide. At the east extent of this feature, ground cracks about 400 mm wide and 300 mm deep were observed. Some leaning trees were also noted at the east end of the ground cracks (Photo 5). A survey control monument appeared to be sliding downhill due to slope movement.</li> <li>• Leaning mature coniferous and deciduous trees were observed within the east landslide.</li> <li>• The highway surface does not appear to be affected by the east landslide at the time of the site visit.</li> <li>• Seepage was observed within the east landslide near the east and west extents (Photo 6 and 7).</li> <li>• The south shoulder scarp is retrogressing towards the highway as indicated by a new tension crack. The crack was about 3 m long, up to 150 mm deep and 100 mm wide. The crack is about 5.2 m away from the guardrail (Photo 8).</li> <li>• A scarp about 25 m long and 200 mm high was observed south of the highway approximately at the same station as the "Hinton Entrance" sign. The scarp was at the base of the embankment and about 1.9 m away from the guardrail (Photo 9 and 10).</li> <li>• Most of the north highway ditch was severely eroded.</li> <li>• The river levels appear to be higher than previous inspections despite a relatively dry season. This could be due to excessive melting of the Athabasca glaciers because of an intense heatwave prior to the site visit.</li> </ul>	
<b>RECOMMENDATIONS</b>	
<ul style="list-style-type: none"> <li>• The NC11 slope remediation tender was recently awarded in mid-July and is scheduled for construction this year. As part of construction, the highway backslope will be excavated to make room for realigning about 750 m of Hwy 40. No other remedial recommendations are required at this time.</li> <li>• Given the lack of instrumentation at the east midslope landslide location, survey control points could be installed to monitor slide retrogression towards the highway. Alternatively, InSAR or LiDAR change detection can be completed to monitor landslide activity.</li> <li>• The site should continue to be inspected annually.</li> <li>• Instrumentation monitoring should continue semi-annually.</li> </ul>	

<b>PREPARED BY:</b> Leslie Cho, M.Eng., P.Eng.	<b>REVIEWED BY:</b> Carrie Murray, M.Eng., P.Eng.

2021 Site Inspection Photos at NC011



**Photo 1:** Pavement cracking at west extent. Looking east.



**Photo 2:** Pavement cracking approximately at midpoint. Looking east.



2021 Site Inspection Photos at NC011



**Photo 3:** Pavement crack at east extent. Looking west.



**Photo 4:** 1.5 m scarp with wet ground below access bench at west midslope slide. Looking north.



2021 Site Inspection Photos at NC011



**Photo 5:** Ground crack at ridge location at the west extent of the west landslide. Leaning trees in background. Looking northeast.



**Photo 6:** Seepage in west portion of east landslide. Looking northwest.



2021 Site Inspection Photos at NC011



**Photo 7:** Seepage in east portion of east landslide. Looking west.



**Photo 8:** Tension crack behind south shoulder scarp. Distance to guardrail about 5.2 m. Looking southwest.



2021 Site Inspection Photos at NC011

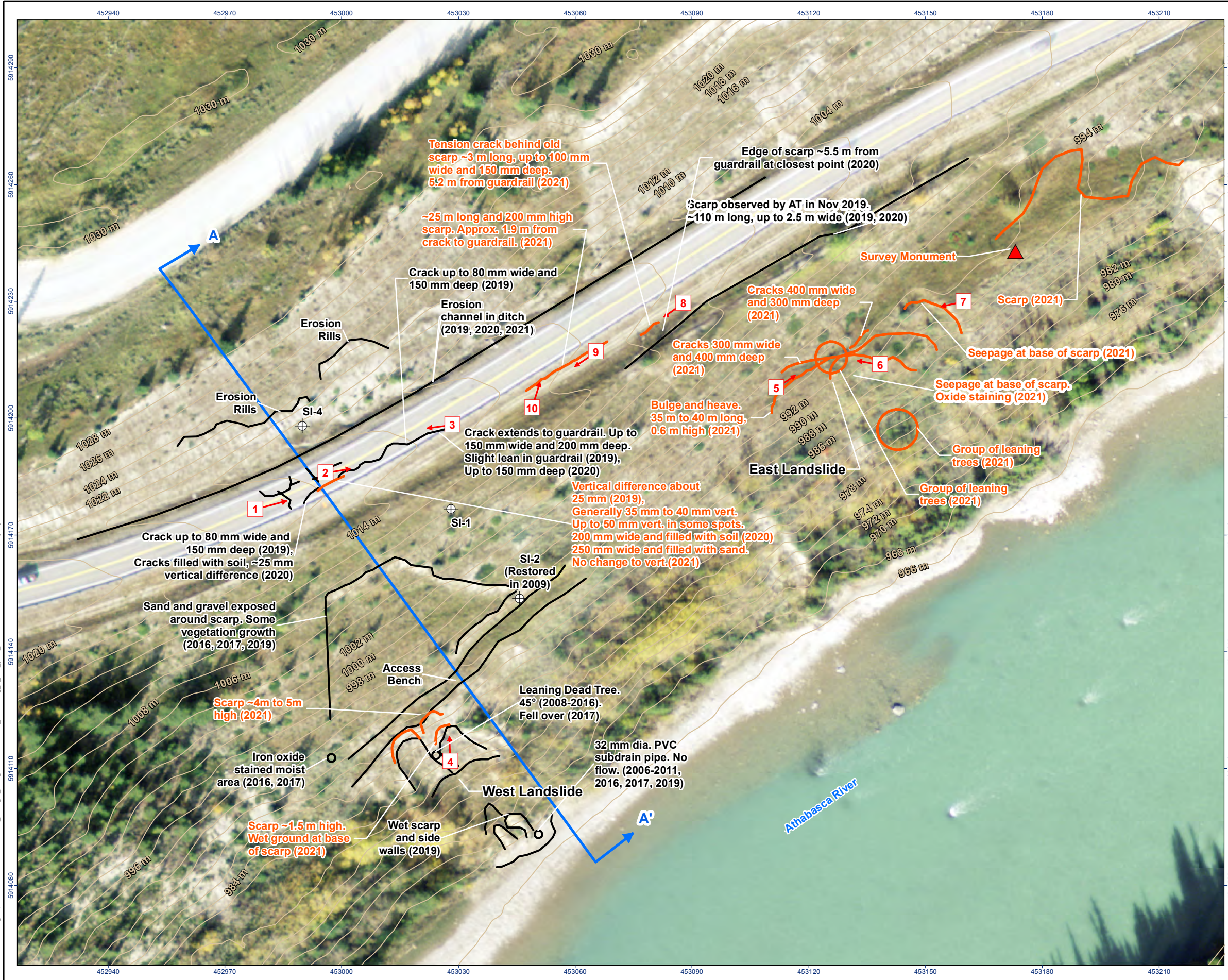


**Photo 9:** New scarp near “Hinton Entrance” sign. Looking west.

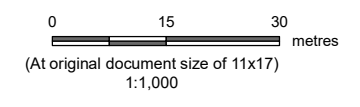


**Photo 10:** West extent of new scarp near “Hinton Entrance” sign. Looking northeast.

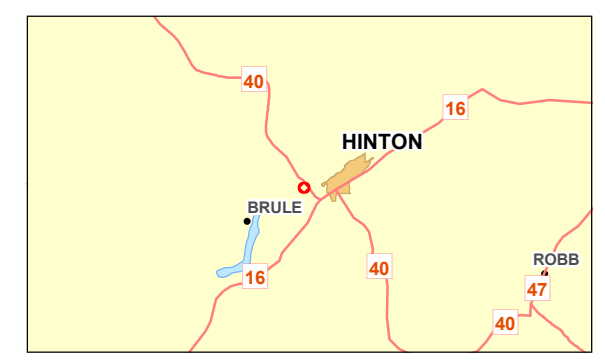




- Approximate Slope Inclinometer Location
- 2021 Observation
- Previous Observation / Site Detail
- Ground Elevation Contours (m AMSL, LiDAR Sept. 2014)
- Cross Section Location
- Photo Number and Direction



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 11N
  2. Imagery: Valtus, Imagery 2012



**Project Location**  
 Hinton, Alberta

Prepared by MK on 2021-08-31  
 Quality Review by LC on 2021-09-14  
 Independent Review by CM on 2021-09-14

**Client/Project**  
 Alberta Transportation  
 Geohazard Monitoring Program  
 NC11 5.5 km North of Hwy 16 (Near Hinton)

12331 5222

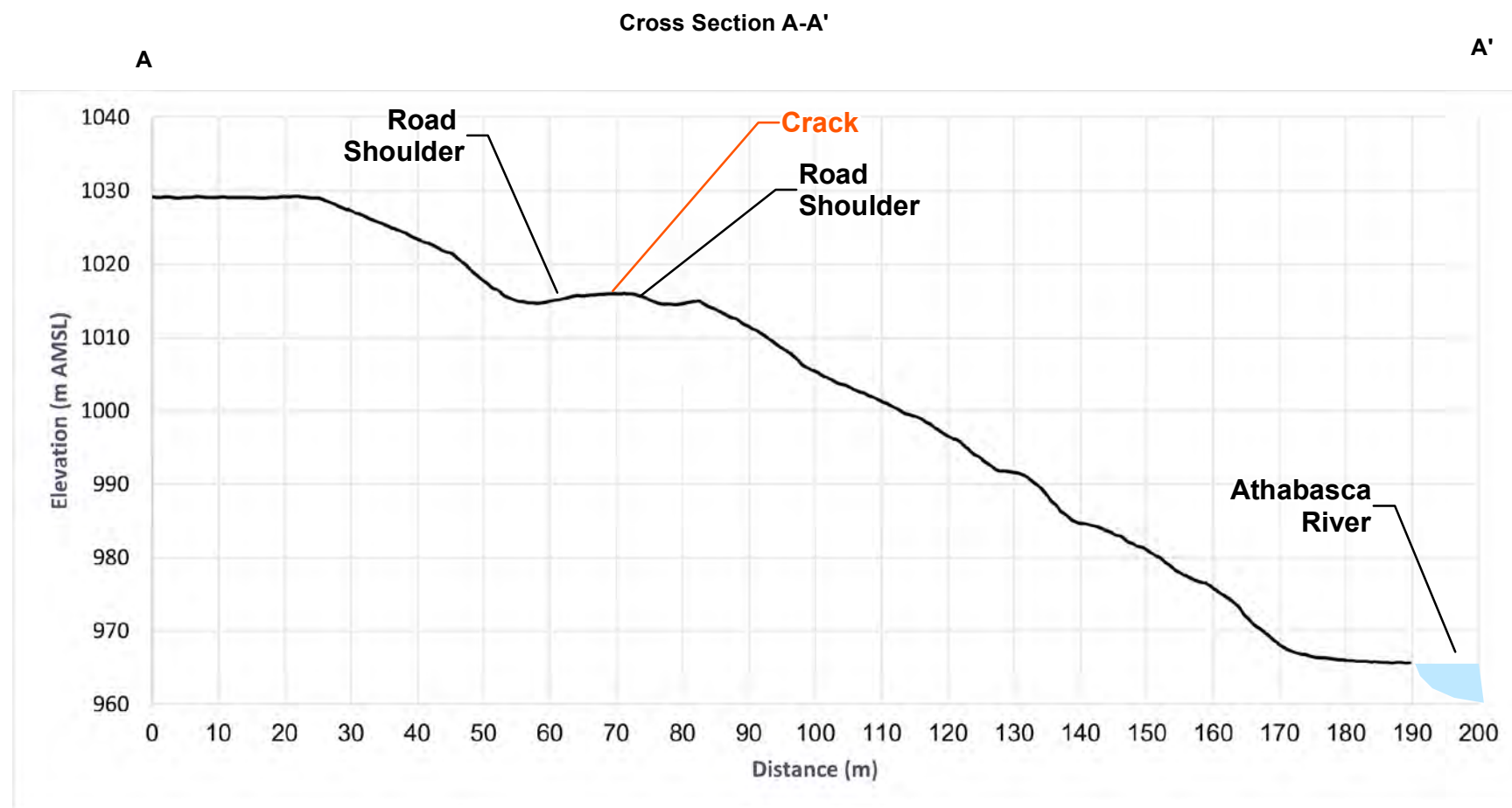
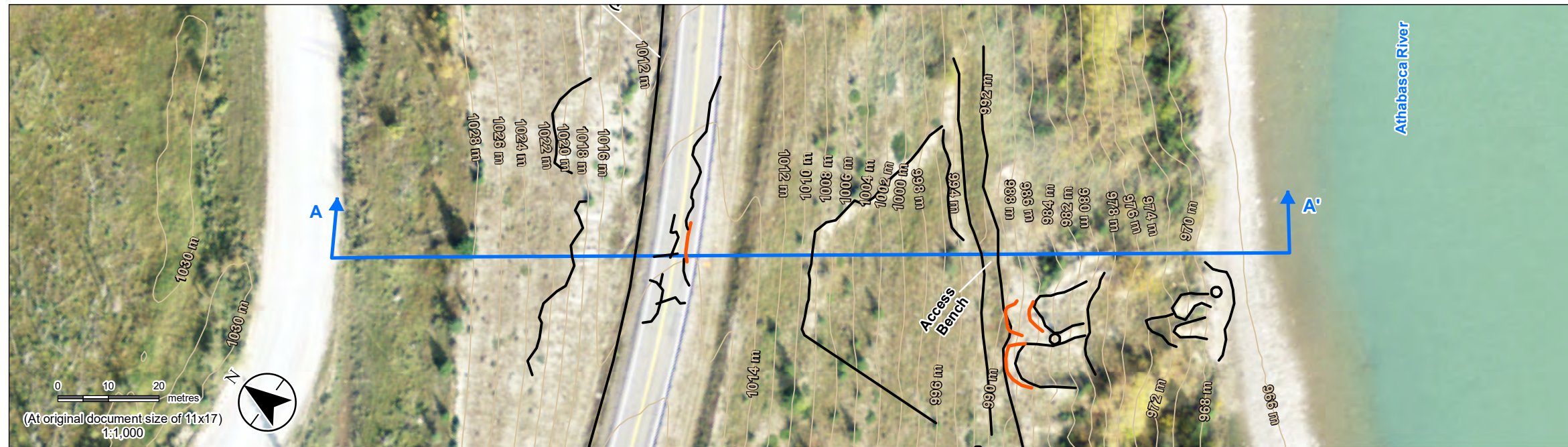
**Figure No.**  
**1**

**Title**  
**Site Plan**

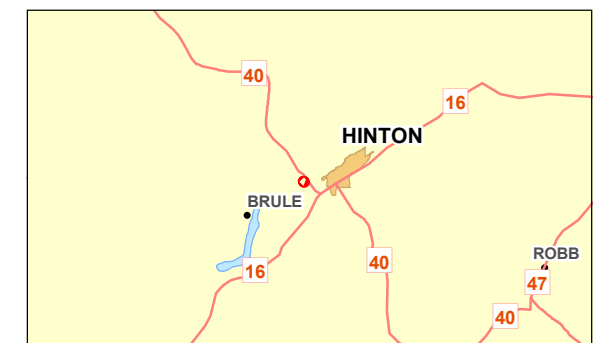
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123315222

**Figure No.**  
**2**

**Title**  
**Ground Profile of Section A-A'**