



GEOHAZARD RISK MANAGEMENT PROGRAM
North Central Region – Edson Area
2015 Inspection Report



Site Number	Site Name	Hwy	km
NC32	North of Tomahawk	759:04	N/A
Legal Land Description		UTM Coordinates (NAD83)	
NW 13-51-6-W5M and NE 14-51-6-W5M		Zone 11U	N5920211 E648666
Operational Site Instrumentation		Slope Inclinometers	2
		Pneumatic Piezometers	5
		Vibrating Wire Piezometers	0
		Standpipe Piezometers	0
Date of Last Instrumentation Readings		May 12, 2015	

	Date	PF	CF	Risk Rating
Current Inspection	June 18, 2015	5	3	15
Previous Inspection	June 26, 2014	5	3	15
Report Attachments	<input checked="" type="checkbox"/> Photographs (4 pages)		<input checked="" type="checkbox"/> Site Plans (1 page)	

	Golder	Alberta Transportation
Inspected By	Laurent Gareau; Kevin Wallin	Rocky Wang; Ali Khalid; Kathleen Davis
Date of Remediation	Berms constructed on either side of the Hwy in 2013	
Recent Maintenance		
Primary Site Issue	The distress at this site is likely associated with high groundwater levels and weak foundation soils, combined with increased truck volume.	
Observations	Description and Location	Change From Previous Inspection
<input checked="" type="checkbox"/> Pavement Distress	- Crack extension and widening	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Culvert Distress		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Bridge Distress		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Slope Movement	- Continued slope movement evidenced by crack widening	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input type="checkbox"/> Erosion		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Seepage		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Other		<input type="checkbox"/> Yes <input type="checkbox"/> No





<p style="text-align: center;">Discussion</p>	<p>Several cracks observed in the pavement surface have elongated and widened since the 2014 inspection. Based on site observations, cracks along the road surface had widths between 0 and 30 mm with one crack showing a vertical differential of up to 10 mm, as seen in Photographs 1 to 6.</p> <p>The ponded water observed at the north end of the berm on the west side of the highway was no longer present at the time of the inspection (see Photograph 7).</p> <p>A significant amount of vegetation growth was observed in the east and west ditches since the 2014 inspection, as seen in Photograph 8.</p>
<p style="text-align: center;">Assessment</p>	<p>All five functioning piezometers showed decreased groundwater levels since the Fall 2014 readings. The groundwater levels at the site are still relatively high, with depths ranging from about 0.7 m to 4.5 m below ground surface.</p> <p>Since initialization and prior to the construction of the berms, SI1 and SI2 have been moving at average rates of approximately 3 mm/yr and 14 mm/yr, respectively. The Spring 2015 reading for SI1 showed a continuing creep movement at a rate of approximately 1 mm/year. SI2 showed no movement.</p> <p>The effectiveness of the berms has yet to be determined; however, the creep movements shown in SI1 and the crack pattern progression on the road could suggest ongoing movements that are likely governed by the weak foundation soils.</p> <p>It is understood that a gravel pit operating in the area has been increasing the truck volume along the highway in the area since about 2011. This increased loading may be further adding to the pavement distress. Additionally, according to available subsurface data, part of the highway embankment in this area was built over muskeg.</p> <p>Further monitoring is required to assess the nature of the slope movement issue at this site. Golder will monitor the Fall 2015 readings at the site to see if any deeper seated movements are present.</p>
<p style="text-align: center;">Recommendations</p>	<p>Short term remediation should include:</p> <ul style="list-style-type: none"> ▪ sealing pavement cracks to reduce surface water infiltration into the pavement structure and the slope; ▪ inspecting the pavement surface on a regular basis to monitor height differentials across the cracks; and, ▪ overlaying if warranted for traffic safety. <p>No long term recommendations are recommended at this time as the effectiveness of the berms has yet to be determined.</p> <p>As the effectiveness of the berms has yet to be determined, it is recommended that all instruments at the site continue to be read semi-annually, with the site inspections continuing annually.</p>



PHOTOGRAPH 1: Pavement crack at north end of site in northbound lane, facing south.



PHOTOGRAPH 2: Transverse pavement crack at north end of site, facing west.



NC32 – NORTH OF TOMAHAWK
2015 Annual Inspection Photographs



PHOTOGRAPH 3: Pavement distress near midpoint of site in northbound lane, facing south.



PHOTOGRAPH 4: Pavement near midpoint of site in northbound lane, facing south.



PHOTOGRAPH 5: Transverse crack at south end of site, facing west.



PHOTOGRAPH 6: Pavement distress at south end of site in southbound lane, facing south.



PHOTOGRAPH 7: Ponded water on the north side of the west berm no longer present, facing southwest.



PHOTOGRAPH 8: Ditch along east side of highway has become overgrown, facing south.