

## GEOHAZARD RISK MANAGEMENT PROGRAM

### North Central Region – Edson / Stony Plain Area

#### 2019 Inspection Report

Site Number	Site Name		Hwy	km
NC39	South of Sturgeon River Crossing		825:02	8.73
Legal Land Description	NE 29-55-22-W4M			
NAD 83 Coordinates	3TM 114	N5961514	E 51115	
Operational Site Instrumentation	Slope Inclinometers		0	
	Pneumatic Piezometers		3	
	Vibrating Wire Piezometers		0	
	Standpipe Piezometers		1	
Date of Last Instrumentation Readings	May 10, 2019			

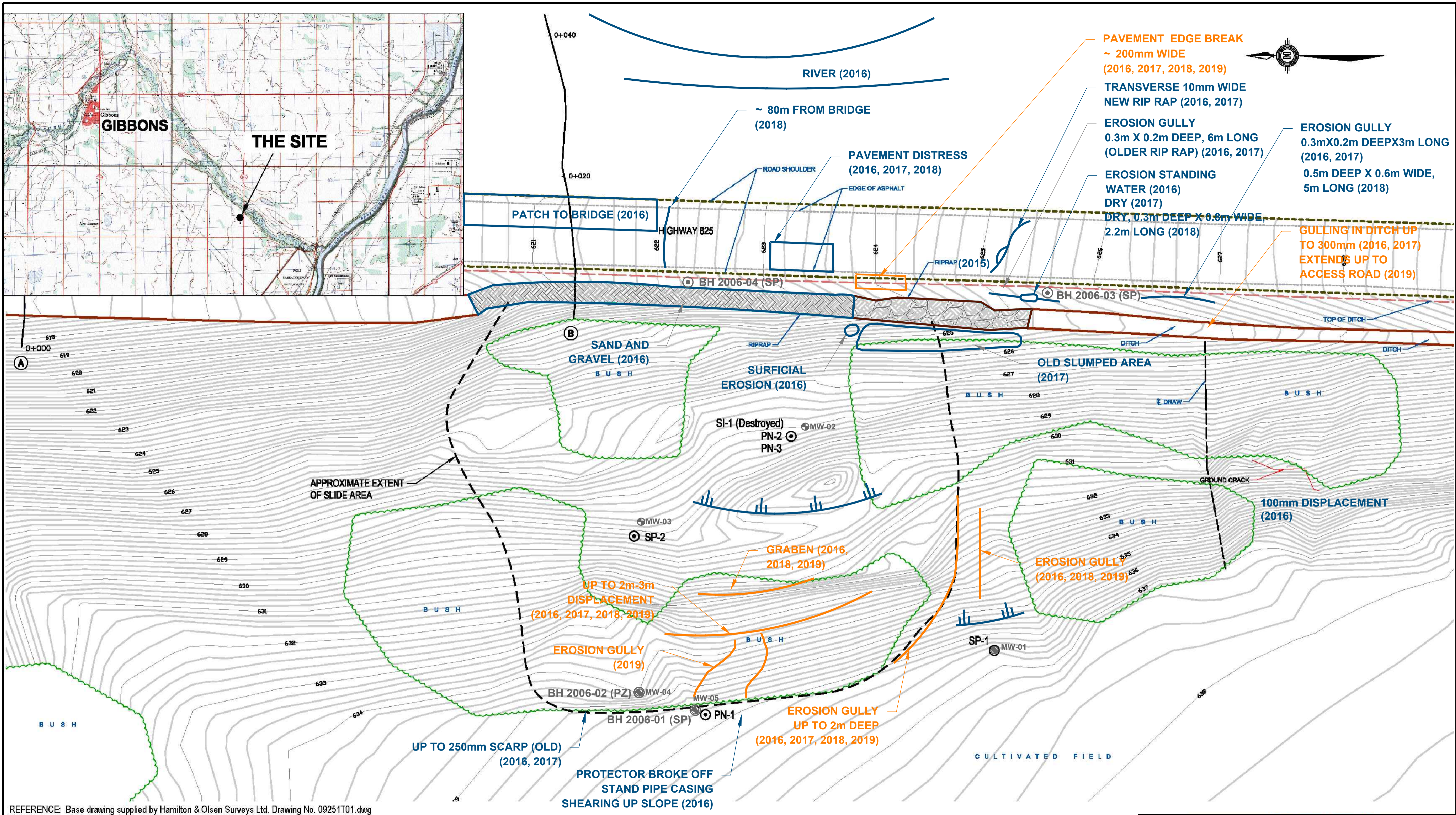
Risk Assessment	Date	PF	CF	Risk Ranking
Current Inspection	May 13, 2019	9	2	18
Previous Inspection	May 29, 2018	9	2	18
Report Attachments	<input checked="" type="checkbox"/> Photographs (6 photos)		<input checked="" type="checkbox"/> Site Plans (1 page)	

	Stantec	Alberta Transportation
Inspected By	Leslie Cho and Xiteng Liu	Kristen Tappenden, Brennan Evans, and Corbet Kratko
Date of Remediation	2004/2005 – Riprap added in the west ditch 2015 – Ditch regraded with riprap added in the west ditch	

<b>Recent Maintenance</b>	2006 – Pavement dip patched 2016 – Milled and paved		
<b>Primary Site Issue</b>	Backslope failure on the west side of Highway 825		
<b>Observations</b>	<b>Description and Location</b>	<b>Change from Previous Inspection</b>	
<input checked="" type="checkbox"/> Pavement Distress	Patch of longitudinal cracks approximately 10 m north of the riprap. Transverse crack on the south end of the riprap. Pavement edge break along riprap.	<input type="checkbox"/> Yes	<input checked="" 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	Graben near bush line southwest of SP2. Scarps observed upslope from graben. Scarp located several meters east of SP1. Ground crack approximately two-thirds the way up slope passed the west bush line on the south end of the site.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<input checked="" type="checkbox"/> Erosion	Surficial erosion several meters upslope from the north end of riprap. Erosion gullies along the west ditch near BH 2006-03. Erosion gully downslope from SP1 and PN1.	<input type="checkbox"/> Yes	<input checked="" 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

<b>Discussion</b>	<p>Pavement cracking consisting of transverse and longitudinal cracks was observed at various locations at the site. Photo 1 is located approximately 10 m north of the riprap and shows an area of severe longitudinal cracking that is progressing into alligator cracking. Photo 2 shows a portion of the collapsed shoulder along the riprap. Increased erosion was observed around the collapsed shoulder. Cracks at the site had widths up to about 10 mm with no vertical differential. No significant change in pavement cracks were observed compared to the 2016 inspection.</p> <p>Surficial erosion of the backslope was observed at localized areas. More erosion gullies were observed along the west ditch than in previous years and appeared to be getting more interconnected. Photo 3 shows some interconnected erosion features in the west ditch. Water was observed to be pooling in the gullies. Cobbles were also observed within the erosion gullies.</p> <p>Irrigated fields at the crest of the slope are currently being used for agricultural purposes. An erosion gully leading from the slope crest near SP1 was observed.</p> <p>The scarps and grabens remained unchanged since the 2016 inspection. Scarps up to 3 m high were observed along the graben as shown in Photo 5. The graben remained well vegetated. The slope was very well vegetated and appeared to have covered the previous signs of visual distress at the toe along the highway. An overall view of the toe is shown in Photo 6.</p>
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<b>Assessment</b>	<p>The piezometer measurements continued to remain near previous readings at the site. The readings have been stable since about Fall 2013. An overall increase in piezometric level by 1 m was observed at the site but remains within historic trends with the exception of PN3 which saw the highest recorded piezometric level since initiation in 2009.</p> <p>Surface water may be discharging from the field and down over the crest leading to the observed erosion gully near SP1 and PN3 potentially seeping into ground cracks along the slope and driving movements. During periods of heavy precipitation, additional slope movements are anticipated.</p>
<b>Recommendations</b>	<p>Short term recommendations should consist of sealing any pavement cracks (mill and fill or a new overlay) to reduce surface water infiltration into the slope and pavement structure. The erosion gullies within the ditch may be regarded and lined with riprap to reduce the potential for further removal of material at the toe. Diversion of runoff water away from the crest may also be considered to reduce the potential for further erosion of the slope.</p> <p>It is understood that bridge widening of the Sturgeon River is proposed for the 2019/20 timeframe. It is recommended that a geotechnical assessment be included in the design measures to address any cuts into the backslope. Drainage measures should be included in conjunction with slope flattening to reduce pore pressures within the slope.</p> <p>MCI should monitor the toe of the slide for evidence of ditch blockage and re-grade as necessary.</p> <p>Since no active slope inclinometers remain at the site, consideration should be given to installing new slope inclinometers.</p> <p>Instrumentation monitoring should continue to be completed semi-annually with site inspections completed annually. During the site inspection, it was discussed that the inspection frequency for this site may be reduced to every other year.</p>



REFERENCE: Base drawing supplied by Hamilton & Olsen Surveys Ltd. Drawing No. 09251T01.dwg

- LEGEND:
- SI - SLOPE INCLINOMETER
  - PZ - PNEUMATIC PIEZOMETER
  - SP - STANDPIPE PIEZOMETER
  - - SLIDE AREA



1. PREVIOUS OBSERVATIONS SHOWN IN BLUE
2. 2019 OBSERVATIONS SHOWN IN ORANGE

**Stantec**

STANTEC CONSULTING  
400-10220 103 AVENUE NW  
EDMONTON, ALBERTA, CANADA  
T5J 0K4

ALBERTA TRANSPORTATION  
GEOHAZARD MONITORING PROGRAM  
NC39, SOUTH OF STURGEON RIVER CROSSING, AB  
HWY 825:02 - SITE PLAN

DRAWN	MK	CHECK	XL	APPROVE	LC
DATE	25 JUN. 2019	SCALE	AS SHOWN	PROJECT #	123312435

FIGURE - 1

Reference: 2019 Annual Inspection Photographs at NC39 – South of Sturgeon River Crossing  
File Number: 123312435



**Photo 1:** Patch of pavement distress approximately 10 m north of rip rap. Looking southeast.



**Photo 2:** Collapsed pavement shoulder along rip rap approximately 200 mm wide. Looking north.

Reference: 2019 Annual Inspection Photographs at NC39 – South of Sturgeon River Crossing  
File Number: 123312435



**Photo 3:** Erosion gullies along west ditch. Looking north.



**Photo 4:** Well vegetated graben. No fresh cracking observed.  
Looking southwest.

Reference: 2019 Annual Inspection Photographs at NC39 – South of Sturgeon River Crossing  
File Number: 123312435



**Photo 5:** Erosion near PN-1. Looking southeast.



**Photo 6:** Well vegetated backslope obscuring previously observed exposed bedrock. Looking southwest.