

**ALBERTA TRANSPORTATION
GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – GRANDE PRAIRIE DISTRICT
2019 INSPECTION**



Site Number	Location	Name	Hwy	km
Call Out	South of Debolt	Debolt Creek Slide	43:04	51.2
Legal Description		UTM Co-ordinates (NAD 83)		
SE11-72-1-W6		11U N 6,119,131	E 434,643	

	Date	PF	CF	Total
Previous Inspection:				
Current Inspection:	May 29, 2019	11	3	33
Road AADT:	7690	Year:	2018	
Inspected By:	Don Proudfoot, Nicole Wilder (Thurber) Ed Szmata, Rocky Wang, Dwayne Lowen (AT)			
Report Attachments:	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input type="checkbox"/> Maintenance Items			

Primary Site Issue:	Landslide with 2 m high backscarp in embankment fill on north side of highway (16 m from guardrail).	
Dimensions:	About ~18 m long by 16 m wide	
Date of any remediation:		
Maintenance:		
Observations:	Description	Worse?
<input type="checkbox"/> Pavement Distress		<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	The landslide occurred within the north embankment fill adjacent to the east side of a 4.6 m diameter culvert inlet of Debolt Creek. The slump appears to be a shallow retrogressive slide.	<input type="checkbox"/>
<input checked="" type="checkbox"/> Erosion	Active erosion taking place by surface water and seepage flowing down slope removing fill beneath the northeast swale and subsequent erosion has damaged the northeast ditch swale.	<input type="checkbox"/>
<input checked="" type="checkbox"/> Seepage	Water was found ponded near the 800 mm diameter CSP culvert to the west of our site where the start of the northwest swale was. There was no flow through that culvert at the time of our visit.	<input type="checkbox"/>
<input type="checkbox"/> Bridge/Culvert Distress		<input type="checkbox"/>
<input checked="" type="checkbox"/> Other	A grown over shallow slump failure was observed above the culvert inlet just west of the active slide.	<input type="checkbox"/>

Instrumentation: None

Assessment:

The slide is approximately 18 m long by 16 m wide and located in a 10 m high embankment fill side slope. The soils exposed in the slide scarp appeared to consist of grey high plastic clay. The slide mass has slid along the east side of the 4.6 m diameter culvert down to the class II riprap near the inlet.

There was no pavement distress observed during the call-out visit, but there was relatively fresh sloughing and moist soil within the slide mass, which was marked with many small secondary scarps and tears further downslope. No seepage was observed during the site visit.

It is anticipated that the slide is a relatively shallow, retrogressive slide that was triggered by water seepage and weathering leading to loss of cohesion in the embankment fill. Poor embankment materials and a relatively steep slope may also have contributed to causing the slide. To the west of the slide directly

above the culvert inlet there appears to be an older slide that was grown over. The main scarp of the active landslide appears to be retrogressing further back towards the highway (measured at 16 m from the guardrail) and could eventually begin to affect the highway if not remediated.

The backslope slumping appears to be shallow based and is not anticipated to be connected to a deep-seated slide below the highway.

Recommendations:

Investigation:

Drill one test hole above the main scarp on the north side of the highway to a depth of about 20 m. The test hole should be completed with a piezometer. This would provide information on the embankment fill and groundwater conditions and potential depth of slide movement at this location and confirm slope stabilization design measures.

Short Term:

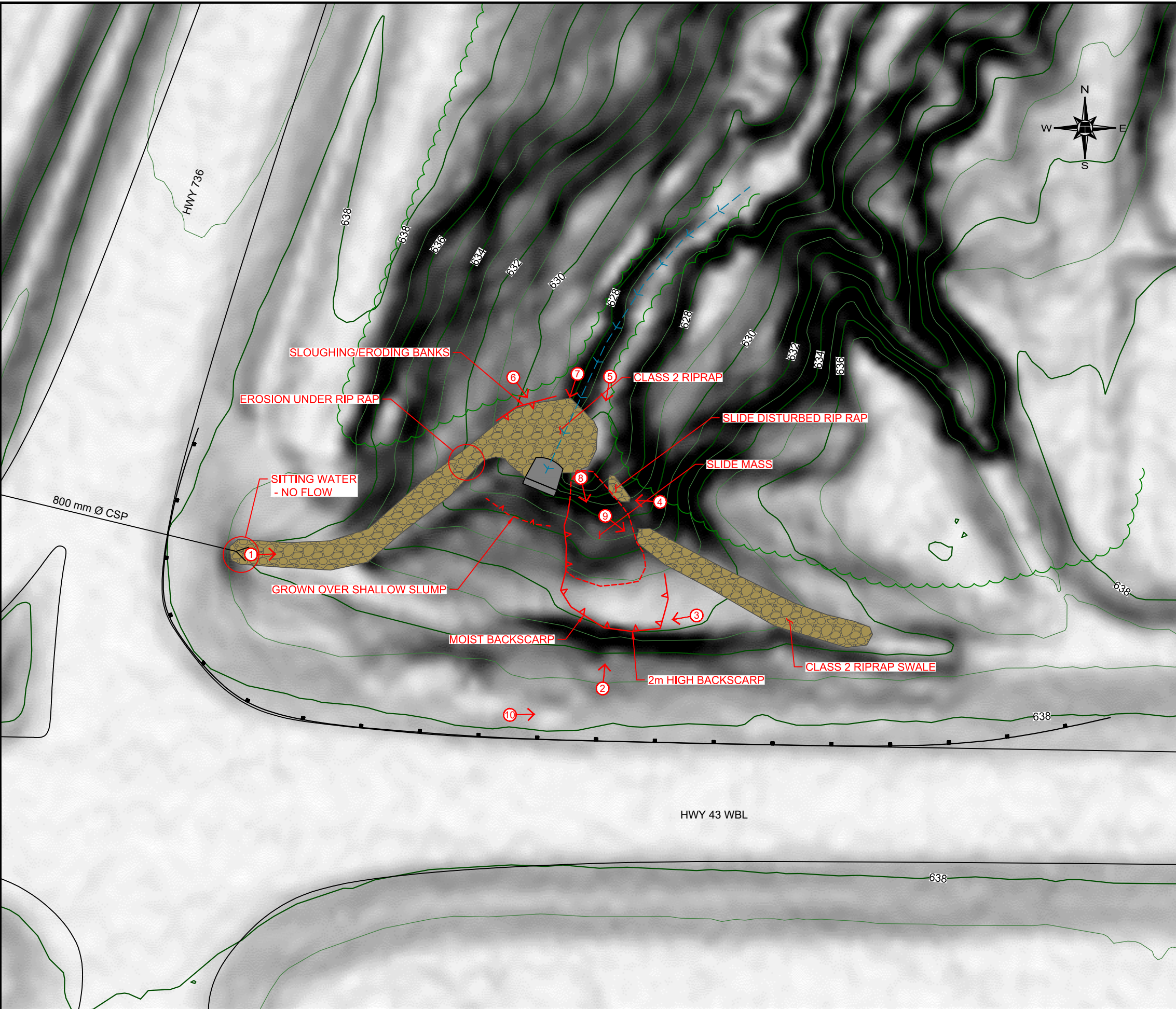
In the short term, the slide should be regularly monitored for regression of the slide scarp.

Medium to Long Term:






The recommended repair for this project is to sub-excavate the failed slide mass down to intact foundation soil and rebuild the slope with imported 6-80 gravel to a slightly flatter 3H:1V inclination. The new fill material should be placed and compacted in thin horizontal lifts, benched into the intact slope surface, utilizing a gravel shear key (if required) to stabilize the slide area. Some of the more suitable excavated material could be used to provide a covering layer overtop the gravel as the finished slope surface to shed runoff, with any excess removed from site. A subdrain should be installed along the base of the slide excavation to drain any subsurface water that may enter the new fill zone. Any existing Class 1/2 riprap should be salvaged and re-instated over non-woven geotextile along a new contoured channel of the NE swale. Some additional riprap will likely be required.

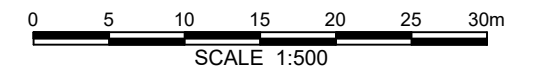
Ballpark Cost ~\$0.4 Million

H:\13000\13353 Geohazard Assessment - Grand Prairie (CON0017603)\Drafting\2019\NPW\Debolt Callout\13353 Callout 43_04.dwg - Layout1 - Aug. 16, 2019



LEGEND

-  SCARP
-  TREE LINE
-  GUARD RAIL
-  STREAM
-  DIRECTION AND NUMBER OF PHOTO



**2019 CALLOUT HWY 43:04 km 51.2
SOUTH OF DEBOLT, AB**

SITE PLAN

DWG No. 13353-CALLOUT

DRAWN BY	KLW
DESIGNED BY	NPW
APPROVED BY	DWP
SCALE	1:500
DATE	AUGUST 2019
FILE No.	13353





Photo 1.
Looking east from
800 mm CSP
culvert towards
slide.



Photo 2.
Looking north at
slide standing
above the
backscarp.



Photo 3.
Looking west at
slide backscarp.



Photo 4.
Looking west
towards culvert
inlet and slide
mass.



Photo 5.
Looking south
towards slide and
Highway 43.



Photo 6.
Looking south
towards culvert
inlet and slide on
the left side of it.



Photo 7.
Looking south at
culvert inlet.



Photo 8.
Looking southeast
at slide scarp.



Photo 9.
Looking east at
slide scarp and at
disturbed swale
and riprap.



Photo 10.
Looking east
standing south of
the slide scarp.