

**GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – PEACE-HIGH LEVEL
CALL-OUT INSPECTION (MAY 22, 2015)**



Site Number	Location	Name	Hwy	km
PH52	Dunvegan	Dunvegan North 10+800	2:68	10.80
Legal Description		UTM Co-ordinates		
SE¼ 16-080-04 W6M		11U E 402466	N 6199552	

	Date	PF	CF	Total
Previous Inspection:	12-May-2015	14	4	56
Current Inspection:	22-May-2015	16	4	64
Road AADT:	2910		Year:	2014
Inspected By:	Ed Szmata, TRANS Ken Misik, TRANS		Shawn Russell, Thurber	
Report Attachments:	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input type="checkbox"/> Maintenance Items			

Primary Site Issue:	On May 21, 2015, Alberta Transportation was alerted that the dip in the pavement had dropped suddenly in the NBL lanes of Hwy 2.		
Dimensions:	Arcuate cracking defines a slide that is approximately 22 m to 28 m wide at the road shoulder (Photos 1 to 4).		
Maintenance:			
Observations:	Description	Worsened?	
<input checked="" type="checkbox"/> Pavement Distress	Cracks have up to 80 mm drops with openings as wide as 60 mm. as a result TRANS has closed the outer NBL and implemented a localised traffic speed reduction to 50 km/hr through the affected area.	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Slope Movement	The main landslide feature affecting the roadway is active and a drop in the backscarp of 30 mm has occurred since May 12, 2015. Slide above the highway were also noted in the backslope (Photos 11 and 12).	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Erosion	Runoff from both the roadway ditch and the scoured channel below the centerline culvert appears to be causing sediment to accumulate about 80 m downslope below the roadway (Photo 6).	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Seepage	No significant change since May 12, 2015.	<input type="checkbox"/>	
<input checked="" type="checkbox"/> Bridge/Culvert Distress	No significant change since May 12, 2015 (Photos 8 and 9).	<input type="checkbox"/>	
<input type="checkbox"/> Other		<input type="checkbox"/>	
Instrumentation:	There are no instruments installed at this site.		
Assessment:	Landslide cracking in the road continues and the toe bulge is slightly more apparent in the slope below the highway. This failure appears similar to the two other Dunvegan North (PH1N) failures to the west		

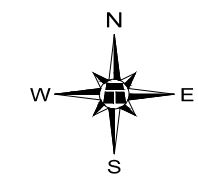
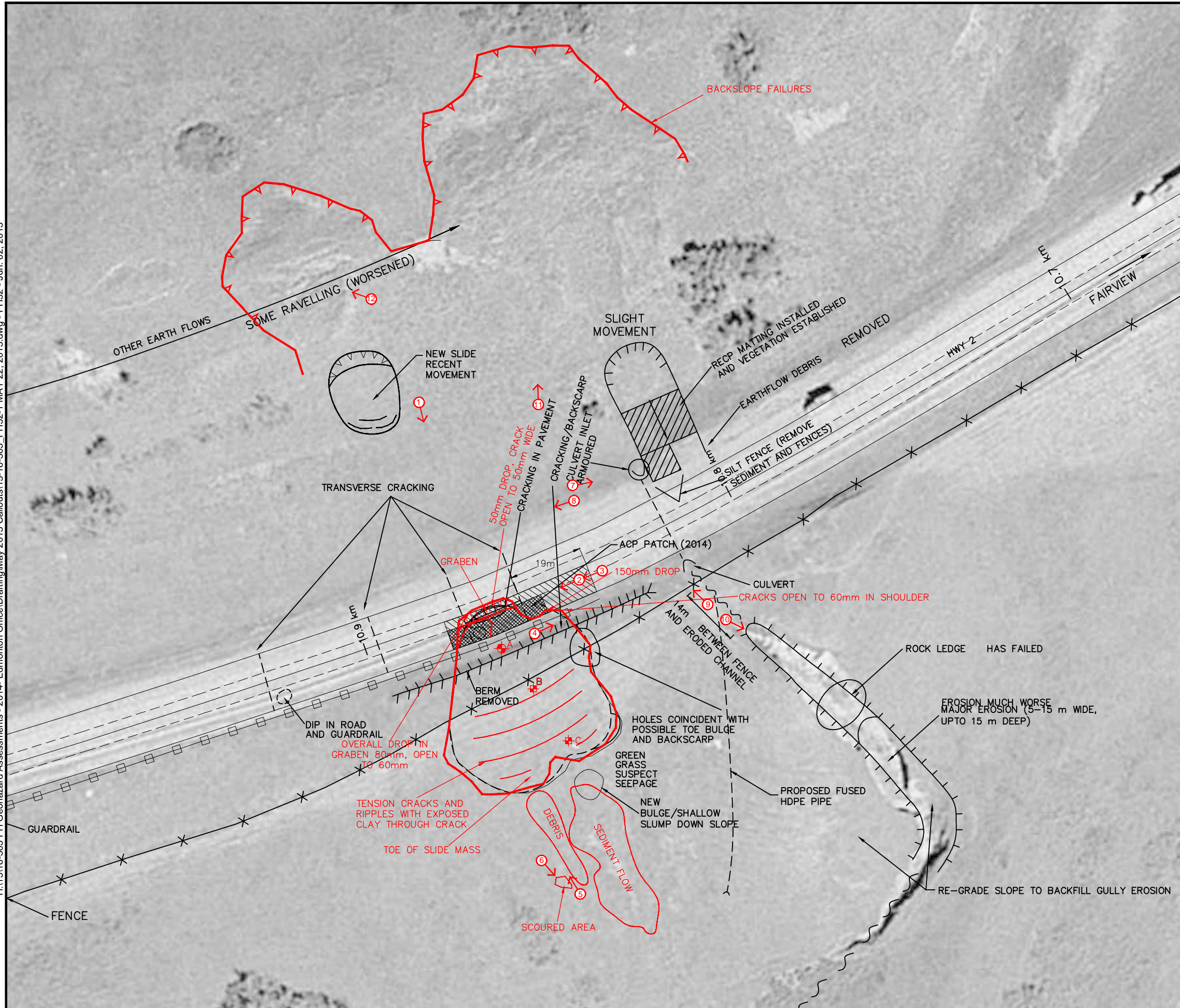
of this site, and so it is suspected that the failure is occurring in fill overlying rock or a native soil surface triggered by groundwater seepage.

Recent accelerated landslide movement warrant that the affected northbound lane be closed to traffic.

Backslope failures observed at the crest of the valley slope above the affected highway may indicate the additional runoff water if fed into the landslide area below.

Recommendations:	Cost
A geotechnical investigation is required to assess the mechanism of failure and to design repair measures for this slide. Proposed test hole and test pit locations with selected instruments are shown on Figure 1.	\$ 60,000
Due to the recent activity at the site, it is recommended that the geotechnical investigation be implemented as soon as possible.	
Potential long-term repair solutions include excavation to bedrock and replacement of fill with granular material and subdrains, similar to the repairs at PH1N, or installation of a pile wall. Failure depth will need to be established from the geotechnical investigation and instrument readings over a period of time. Drainage could be directed through a welded HDPE down-drain extending to the valley floor, and the gully backfilled.	\$1,000,000 to \$2,000,000
The existing centerline culvert that crosses the highway immediately upslope of the landslide should be grouted and surface water should be directed along the existing southbound lane ditch the exiting bridge culvert further downslope to the southwest if the downstream culvert and ditch can accommodate the extra flow. Alternatively, the culvert should be flushed out and the erosion gully repaired. The cost of repairing and armouring could be in the order of \$500,000.	
Investigation work should be completed as soon as possible to ensure a reliable depth to the failure surface can be determined.	

H:\1516-305 PH Geohazard Assessments - 2014- Edmonton Office\Drafting\May 2015 Callouts\15-16-305_PHS2-1 MAY 22, 2015.dwg - PHS2 - Jun. 02, 2015



- LEGEND:
- PROPOSED TEST HOLE LOCATION
 - PROPOSED TEST PIT LOCATION
 - DIRECTION AND NUMBER OF PHOTO

PROPOSED TEST HOLE/PIT INFORMATION

TH	DEPTH	INSTALLATIONS
A=	20 m	PIEZOMETER AND INCLINOMETER
B=	5 m	TEST PIT
C=	5 m	TEST PIT

- NOTES:
- 1 LOCATION DATA RECORDED USING HAND HELD GPS RECEIVER. ALL LOCATIONS ARE APPROXIMATE AND ARE FOR ILLUSTRATIVE PURPOSES ONLY.
 - 2 MAY 22, 2015 CALL - OUT OBSERVATIONS SHOWN IN RED



**PEACE REGION (PEACE RIVER/HIGH LEVEL)
PH52 DUNVEGAN NORTH - HIGHWAY 2:68**

**2015 PH52 CALL - OUT INSPECTION PLAN
MAY 22, 2015**

FIGURE 1

DRAWN BY	ML
DESIGNED BY	SGR
APPROVED BY	DWP
SCALE	1:1000
DATE	MAY 2015
FILE No.	15-16-305





Photo 1.
Looking south across the highway from the SBL backslope. Cracks in the pavement surface and along the edge of the guardrail are visible along a 28 m length. TRANS has closed the outer NBL lane due to the drop in the graben.



Photo 2.
Looking SW from the NBL. The drop of the graben is at about 80 mm with cracks open to about 60 mm in width.



Photo 3.
Hairline tension cracks have appeared within the asphalt pavement within the graben.



Photo 4.
Looking northeast at cracks from backscarp extending through the highway embankment shoulder. Cracks at the shoulder are open to about 60 mm in width.



Photo 5.
Looking north at the highway sideslope. Two lobe-shaped features were noted below highway with greener vegetation growing along the lower perimeter. This is likely a sign of water seepage. Ripples with tension cracks are visible in the surface at the base of the lobes and clay is exposed though the grass. No significant change since May 12, 2015.



Photo 6.
Eroded area with exposed clay about 80 m downslope of the highway.



Photo 7.
Looking east at the inlet to the centerline culvert. The inlet is over half filled with sediment.



Photo 8.
Looking southwest along the SBL lane ditch. Sediment is accumulated along the shoulder downslope of the ditch block at the culvert inlet. Highway embankment material is rilled, moist and soft.



Photo 9.
Looking north at the outlet of the existing centerline culvert. The outlet is partially obstructed. No significant change since May 12, 2015.



Photo 10.
There is ongoing erosion in the gully downstream, with steep gully sidewalls in the bedrock. No significant change since May 12, 2015.



Photo 11.
Looking north at large backscarps forming at the crest of the valley slope.



Photo 12.
Looking northwest at large backscarps forming at the crest of the valley slope.