

ALBERTA TRANSPORTATION GEOHAZARD ASSESSMENT PROGRAM PART A: FILE REVIEW

PEACE REGION – PEACE-HIGH LEVEL

PH52 DUNVEGAN NORTH – 10+800

Legal Location:	SE¼16-080-04 W6M
Nearest Landmark:	3 km NE along Hwy 2 from the Dunvegan Bridge
Highway Control Section:	Hwy 2:68
Date of Initial Observation:	May 2007
Date of Last Inspection:	June 2008
Last Inspected By:	Thurber Engineering Ltd.
Instrumentation Installed:	None
Instrumentation Operational:	None
Risk Assessment:	PF = 11 CF = 3 Risk = 33

1. INTRODUCTION

The site is located along Hwy 2, 3 km north and east from the Dunvegan Bridge, on the way to Fairview. The site is near the top of the climb out of the Peace River Valley, and covers a 200 m long section of the road. The site includes a roughly 20 m or potentially wider scarp which extends back into the uphill passing lane. The site also includes an up hill shallow soil failure that was repaired in 2007.

Between Rycroft and Fairview, Highway 2 crosses the Peace River via a suspension bridge at Dunvegan. On the north side of the river, the road climbs 200 m over a distance of 3.6 km, up the relatively steep valley walls.

The location of the site is shown on Figure 1, while site details are shown on Figure 2, based on the last inspection.

No historical information was available from Alberta Transportation regarding this site.

2. BACKGROUND

2.1 Bedrock Geology

Based on the AGS 1:1,000,000 bedrock geology map of Alberta, the site is underlain by the Upper Cretaceous Kaskapoo Formation and Dunvegan Formation. Rocks in the Kaskapoo Formation, which outcrop near the crest of the valley, consist of silty shale, thin ironstone bands, quartzose sandstone and thin oolitic mudstone beds. Dunvegan Formation rocks, which outcrop in the valley walls, consist of fine sandstone with hard calcareous beds, laminated siltstone and silty shale.

2.2 Surficial Geology

The unpublished Liverman U of A thesis and the AGS Bulletin 16 1 inch to 4 mile map indicate that the site consists of colluvial soils, with the upland areas covered by lacustrine clay, silt and sand.

2.3 Hydrogeology

The ARC 1:250,000 Hydrogeology Map 125 shows no springs or flowing wells in units expressed in the upper valley sides. Local perched water tables might be present in lenses of more permeable materials (e.g. sand) within the colluvial and lacustrine deposits.

2.4 Geomorphology

The site is in a cut and fill section of the road on the valley side, with exposures of rock downhill of the road at the east end of the site at the culvert outlet. Significant erosion has occurred downstream of the culvert outlet in rock, leaving a 5 m to 10 m wide channel eroded up to 10 m deep. West of this, the road appears to be in fill, with an apparent dip in the natural ground surface downhill of the road in this area. It is west of the culvert crossing that cracking and settlement in the road surface have been noted. However, no toe bulge has been mapped for this feature.

The slope uphill of the road is generally more uniform, suggesting a cutslope. There are a number of shallow slides that become earthflows on the slope above the road, including one that obstructed the ditch upstream of the culvert near km 10.8. Other earthflow features have been identified on the slope above the road to the west of the culvert.

3. HISTORIC INFORMATION

3.1 Summary

Settlement of the pavement and cracking were first noted in the Spring of 2007, with a callout inspection conducted in May 2007 as part of the regular geohazard assessments. Local patching was conducted at the site and a pavement overlay done through the area during 2007. Cracking and settlement worsened prior to our 2008 inspection.

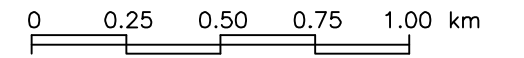
Other than the callout inspection and one annual inspection, no other investigation of this site has occurred.

After our initial callout inspection, repair work was conducted on the upslope earthflow, and a berm along the downslope road shoulder was removed.

Note that a fibre-optic line runs along the downslope road shoulder.

3.2 Chronology

Spring 2007	Cracking and settlement first noted.
May 2007	Callout inspection. Earthflow plugging upslope ditch. Cracking and settlement noted in the climbing lane, extending across the shoulder at the east end of the site. Severe erosion of channel downstream of culvert at km 10.8.
Summer 2007	Debris removed from upslope ditch and slope repaired – erosion protection measures installed. Berm along downslope shoulder removed. Patching of cracks and pavement overlay.
June 2008	Pavement settlement and cracking has worsened and extended since repairs were conducted. Erosion downstream of the culvert has worsened.



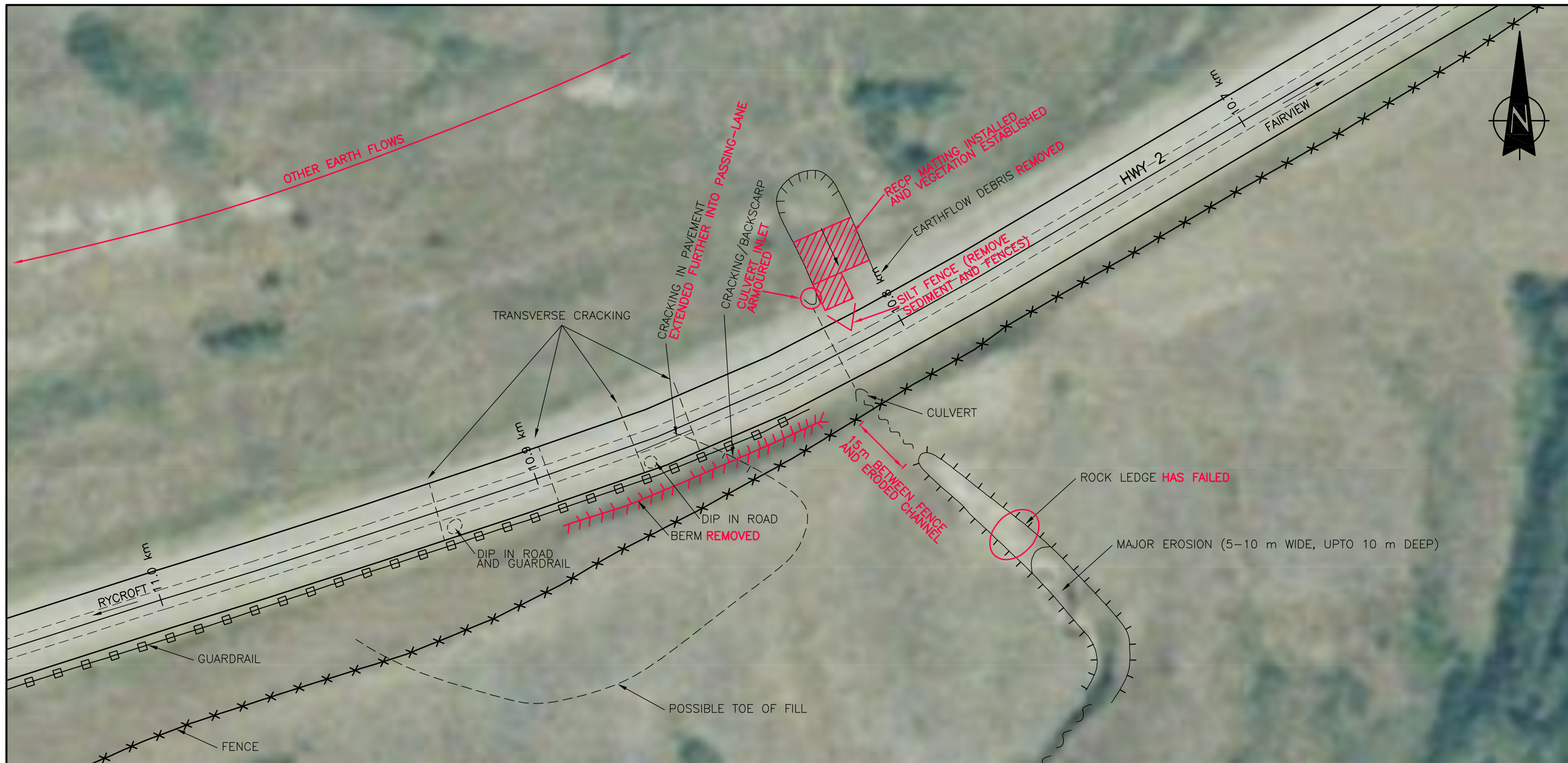
DRAWN BY	ICB	DESIGNED BY	APPROVED BY
SCALE	1:20000	DATE	OCTOBER 29, 2008
		FILE No.	15-16-213A-C4A

Alberta Transportation
 PEACE REGION (PEACE RIVER/HIGH LEVEL)
 HWY 2:68 AT DUNVEGAN

KEY PLAN

FIGURE 1





NOTES:

1 LOCATION DATA RECORDED USING HAND HELD GPS RECEIVER. ALL LOCATIONS ARE APPROXIMATE AND ARE FOR ILLUSTRATIVE PURPOSES ONLY.

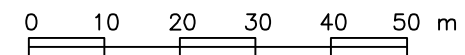
2 2008 OBSERVATIONS SHOWN IN RED

Alberta Transportation

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

SITE PLAN

FIGURE 2



DRAWN BY	ICB	DESIGNED BY	APPROVED BY
SCALE	1:1 000	DATE	OCTOBER 29, 2008
		FILE No.	15-16-213A-A6B



THURBER ENGINEERING LTD.
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS