

SITE NUMBER AND NAME: C034 Abraham Lake Erosion		HIGHWAY & KM: 11:04, 11.056	PREVIOUS INSPECTION DATE: June 12, 2017	INSPECTION DATE: June 11, 2018
LEGAL DESCRIPTION: 07-07-038-17 W5M	NAD 83 COORDINATES: UTM Northing Easting 11 5789173 539996		RISK ASSESSMENT: PF: 13 CF: 6 TOTAL: 78	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 225 (west) & 216 (east) (Ref No. 50110250)			CONTRACT MAINTENANCE AREA (CMA): 18	

SUMMARY OF SITE INSTRUMENTATION: None LAST READING DATE: n/a	INSPECTED BY: Chris Gräpel (KCB) Ryan Gazley (KCB) Rocky Wang (AT) Tony Penney (AT)
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PRIMARY SITE ISSUE: Erosion and retrogression of a slope along the east side (eastbound lane) of Hwy 11/west side of Abraham Lake – a reservoir created by the Bighorn Dam on the North Saskatchewan River. The erosion is caused by pavement surface runoff, seepage, and wave action when the reservoir level is high.

APPROXIMATE DIMENSIONS: The site is approximately 220 m long, and the slope is approximately 12 m to 15 m high sloped between 1H:1V to 1.5H:1V.

DATE OF ANY REMEDIAL ACTION: July 2006 – slope reinforced with soil nails, steel mesh, and shotcrete; Spring 2017 – the highway was realigned to the north (upslope) towards the backslope, a 3-cable high-tension-cable barrier (HTCB) was installed, and an asphalt curb was installed to redirect pavement surface runoff away from the erosion gullies on the eroded slope. Spring 2018 – erosion gullies backfilled with gravel (waypoint 675 and 676) and asphalt curb partially removed.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Pavement cracked, undermined and collapsing; guardrail hanging in two locations; highway realigned in 2017		X
Slope Movement		X	None observed		X
Erosion	X		Slope at or retrogressing towards edge of pavement; erosion gullies forming within gravel backfill; evidence of wave erosion at toe; evidence of seepage erosion on slope	X	
Seepage	X		Seepage erosion observed at various points on slope		X
Culvert Distress	X		1200 mm diameter CSP culvert is disconnected at outlet; a detached culvert segment is washed away		X

COMMENTS

Gravel backfill has been placed in the existing erosion gullies on the south shoulder of the highway. Gravel fill is beginning to erode due to surface water runoff and seepage just below the pavement surface. Tension cracks in the gravel fill have appeared near the crest of the embankment.

During gravel placement, a 5 m and 15 m section of asphalt curb was removed (waypoint 675 and 676, respectively).

Three posts of the high-tension-cable barrier (HTCB) close to the edge of asphalt are exhibiting pavement collapse around the base (waypoint 674). The pavement collapse appears to be due to erosion of the underlying materials exposed when the HTCB posts were installed.

The slope continues to retrogress into the eastbound shoulder. Pavement cracks have extended to the edge of the east bound lane.

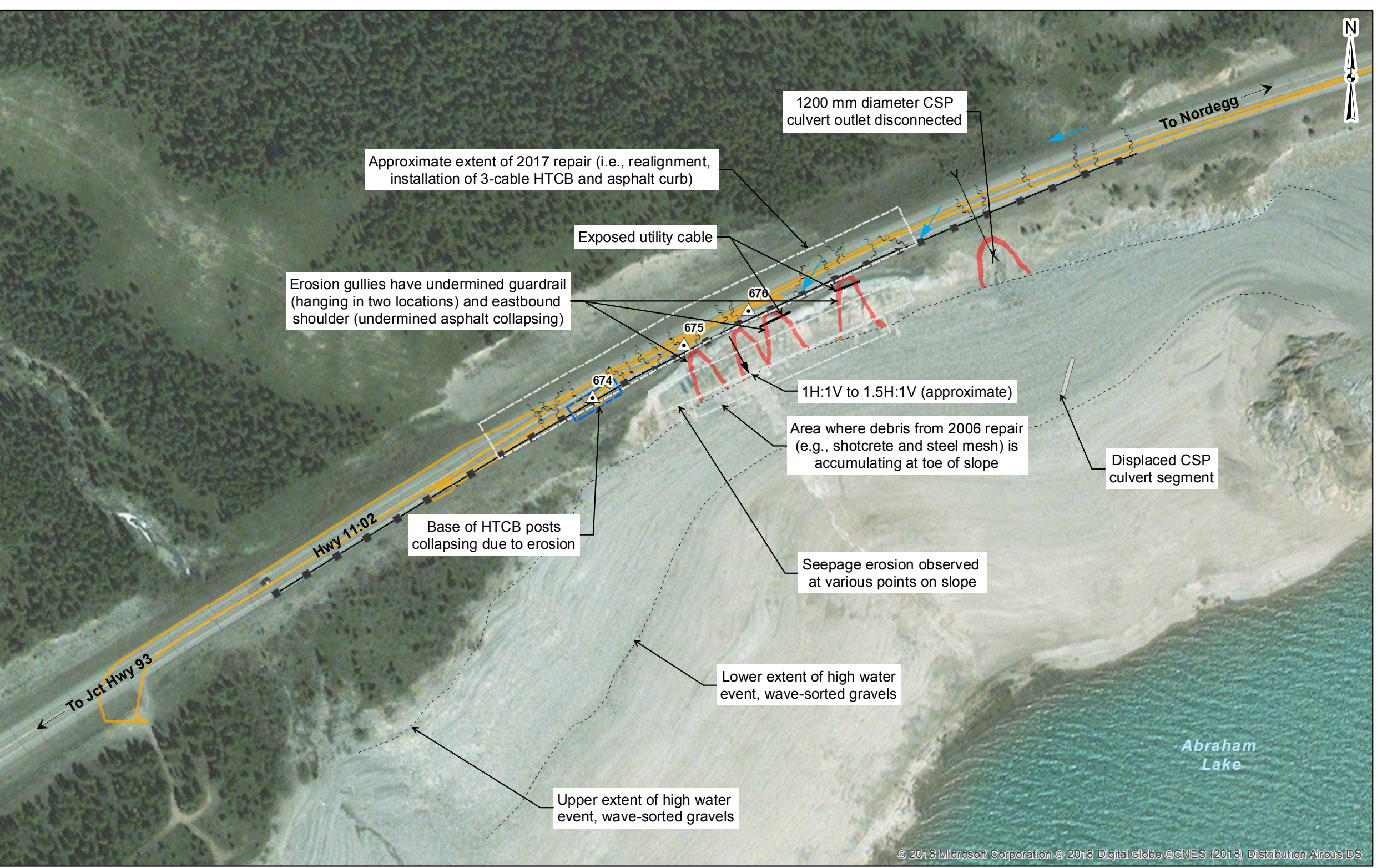
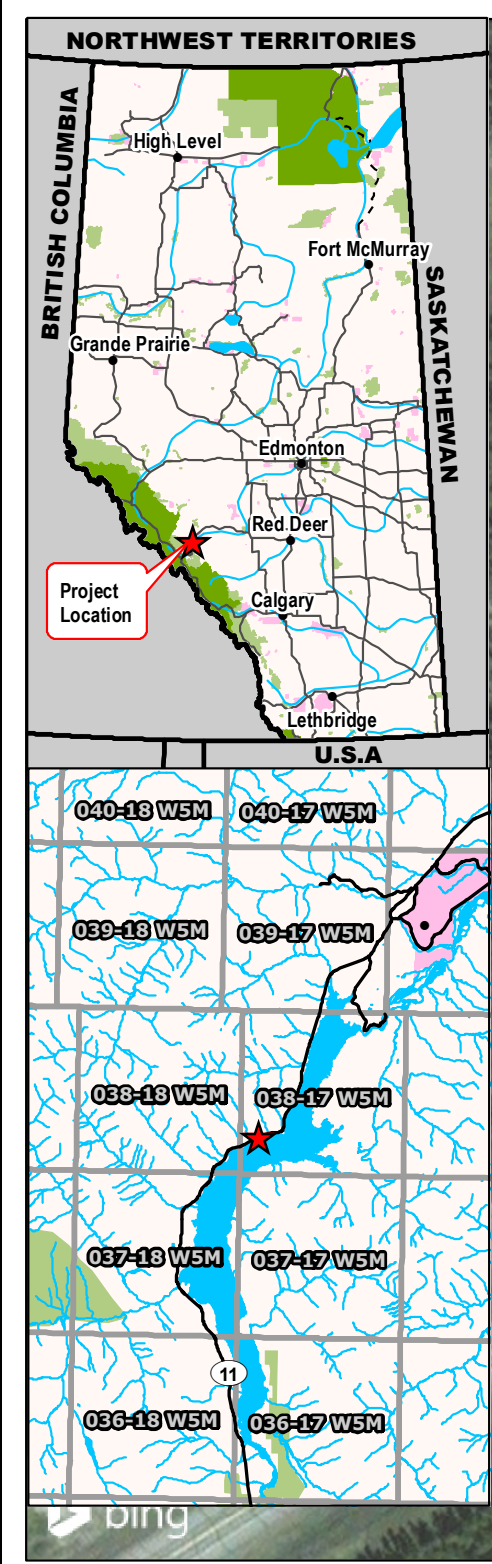
The soil nail, steel mesh, and shotcrete repair continue to be undermined by erosion, and debris from the failed repair is accumulating at the toe of the slope.

A buried utility cable is exposed at several locations along the slope.

Beach access during construction could be via an existing trail to the west of the site, but a creek crossing will be required.

Discussed remedial actions: Replace removed sections of asphalt curb to divert surface run off flows away from gravel fill areas to reduce erosion and extend the asphalt curb across the entire length of the eroding slope; replace all w-beam guardrail with HTCB; extend the curb to provide more protection from surface runoff erosion; construct a rockfill toe berm with riprap armoring; and repair the east culvert and retrieve the detached culvert segment (to be tendered in the fall of 2017 for construction in 2018).

Time: 18:17:18 PM
 Date: July 11, 2018
 File: Z:\A\EDM\A05115A02\Drawings\2018\2_Section B12_2018_Site Inspections\MXD\C034_180711.mxd



Legend

- GPS Waypoint
- Flow Direction
- GPS Track (June 11, 2018)
- Erosion
- Crack
- Extent of Guardrail Collapse
- Guardrail
- Culvert

NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM Zone 11N
 3. IMAGE SOURCE: Bing Maps 2018, Microsoft Corporation.
 Image dated May 2012

CLIENT

PROJECT CENTRAL REGION GEOHAZARD RISK MANAGEMENT PROGRAM		
TITLE Site Plan C034 - Abraham Lake Hwy 11:02, km 11.056		
SCALE 1:2,000	PROJECT No. A05115A02	FIG No. 1

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Photo 1 Gravel backfill placed in the western most erosion gully on the south side (east bound lane) of the highway. Photo taken June 11, 2018 looking south.



Photo 2 Photo showing the section of asphalt curb and guardrail removed (approx. 5m) during placement of gravel backfill in the western most erosion gully (way. Photo taken June 11, 2018 looking northeast.



Photo 3 Photo showing the length of asphalt curb removed (approx. 15) during placement of gravel fill at eastern erosion zone (waypoint 676). Photo taken June 11, 2018 looking northeast.



Photo 4 Tension cracks observed in the gravel fill at the crest of the embankment. Photo taken June 11, 2018 looking northeast.



Photo 5 Gravel fill continuing to erode due to surface run-off flows and subsurface seepage. Exposed buried cable can be seen hanging from embankment material (red circle). Photo taken June 11, 2018 looking south.



Photo 6 Asphalt collapse due to erosion at the base of one of the high-tension cable barrier (HTCB) posts near western extent of the barrier. Photo taken June 12, 2017 looking north.

