



**PEACE REGION
(GRANDE PRAIRIE DISTRICT – SOUTH) GRMP**



SITE INSPECTION FORM

SITE NUMBER AND NAME: GP041 Ditch Erosion North of Grande Cache		HIGHWAY & KM: 40:34, 32.405	PREVIOUS INSPECTION DATE: July 21, 2021	INSPECTION DATE: June 12, 2023
LEGAL DESCRIPTION: SE 04-57-08-W6M	NAD 83 COORDINATES: UTM Northing Easting 11 5973931 360755		RISK ASSESSMENT: PF: 10 CF: 3 TOTAL: 30	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 1,480 (north) & 1,520 (south) (Reference No. 70000104, 2022)			CONTRACT MAINTENANCE AREA (CMA): 504	

SUMMARY OF SITE INSTRUMENTATION: There is no instrumentation at the GP041 site. LAST READING DATE: N/A	INSPECTED BY: Chris Gräpel (KCB) Courtney Mulhall (KCB) Roger Skirrow (TEC) Max Shannon (TEC) Renato Macciotta (UofA)
PRIMARY SITE ISSUE: Erosion feature in north (westbound) ditch of Hwy 40:34 just north of Grande Cache, alongside a previous erosion repair completed in 2006 as described below.	
APPROXIMATE DIMENSIONS: Erosion feature approximately 400 m long, up to 3 m wide, and up to 1.2 m deep with a near-vertical side slope on the south (highway) side. Ditch grade is steep (approximately 5% to 10%).	
DATE OF ANY REMEDIAL ACTION: Repaired in 2006 as described below.	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Erosion has progressed to edge of pavement at WP293.	X	
Slope Movement		X	None observed at time of 2023 inspection.		X
Erosion	X		Erosion ongoing in north (westbound) ditch of highway alongside section repaired in 2006 as described below.	X	
Seepage		X	None observed at time of 2023 inspection.		X
Culvert Distress		X	No culverts observed by KCB.		X

COMMENTS
An erosion feature was repaired in 2006 by placing riprap on a woven geotextile separating medium. The riprap was conglomerate from a nearby quarry and has since experienced various degrees of breakdown due to the matrix material for the conglomerate being sandstone with variable resistance to freeze-thaw particle breakdown. Sometime afterwards (at least once since 2013) limestone or greywacke riprap from a nearby quarry was placed on the 2006 repair to augment the riprap armoring where conglomerate riprap had deteriorated due to freeze-thaw action.
An erosion feature has since formed alongside the riprap due to surface water flow bypassing the riprap, potentially due to inadequate riprap/channel freeboard and snow clearing activities as described below. Also, the riprap armoured ditch was constructed above the toe of the highway embankment, leaving a secondary unarmoured channel for water to flow in closer to the highway.
TEC has previously said that: <ul style="list-style-type: none"> • erosion worsened since the area upslope/east of highway was developed within Grande Cache (clearing, grading, gas station, parking lot); • snowplows can put large thicknesses of snow into the highway ditch which can block flow during spring freshet, causing water to bypass the riprap and flow onto unarmoured portions of the highway embankment fill/ditch side slopes; and • off-road vehicles (e.g., ATVs) are using the highway ditch as a trail which can create tire ruts that can cause erosion to form.
At WP293 erosion at edge of pavement and at WP294 erosion approximately 1.2 m from edge of pavement.
At WP295 a recreational trail crosses the highway ditch.
Channel extends into tree line where eroded material from further upslope/east has been deposited. No erosion at toe of highway embankment observed within tree line.
<u>Maintenance/Repair/Monitoring Recommendations:</u> <ul style="list-style-type: none"> • KCB to submit a proposal for completing an environmental and hydrotechnical assessment, and preparing a repair design and tender for this site (GP041) and the erosion site south of Grande Cache (GP026). Repair options could include a riprap-lined channel, half corrugated-steel-pipe (CSP) slope drain, ditch lined with erosion control product or other synthetic erosion protection material (e.g., Turf Reinforcement Mat, Armourmax, Pyramatress, etc.), key trenches, and/or a recreational crossing at WP295. Estimated cost: approximately \$50,000 and \$150,000, subject to preliminary engineering and discussion with AT on repair extent.

This report is an instrument of service of Klohn Crippen Berger (KCB). The report has been prepared for the exclusive use of Alberta Transportation and Economic Corridors (Client) for the specific application to the Peace Region (Grande Prairie District – South) Geohazard Risk Management Program (Contract No. CON0022166) and it may not be relied upon by any other party without KCB's written consent.

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Courtney Mulhall, M.Sc., P.Eng.
Geotechnical Engineer

Inspection Photographs

- Photo 1** Erosion feature in north (westbound) ditch of Hwy 40:34 at WP294. Note erosion approximately 1.2 m from edge of pavement which is approximately 1.0 m to 1.2 m deep. Photo taken June 13, 2023, facing northwest.



- Photo 2** Erosion feature in north (westbound) ditch of Hwy 40:34 at WP293. Note erosion at edge of pavement which is approximately 1.0 m to 1.2 m deep. Photo taken June 13, 2023, facing northwest.



Photo 3 Erosion feature in north (westbound) ditch of Hwy 40:34. Note exposed geotextile and riprap particles in ditch, some of which are subrounded and composed of conglomerate, and limestone, or greywacke from a nearby quarry. Photo taken June 13, 2023, facing southwest.






Photo 4 Erosion feature in north (westbound) ditch of Hwy 40:34 at WP295. Note recreational trail/road across erosion feature. Photo taken June 13, 2023, facing southeast.





Legend

-  GPS Waypoint (June 12, 2023)
-  GPS Track (June 12, 2023)
-  Ditch Erosion



NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM ZONE 11N
 3. IMAGE SOURCE: 2023 MICROSOFT CORPORATION
 2023 MAXAR CNES, DISTRIBUTION AIRBUS DS

CLIENT


PROJECT
 PEACE REGION (GRANDE PRAIRIE DISTRICT-SOUTH)
 GEOHAZARD RISK MANAGEMENT PROGRAM



TITLE
 Site Plan
 GP041 - Ditch Erosion South of Grande Cache
 Hwy 40:34, km 32.405

SCALE 1:4,000 PROJECT No. A05116A01 FIG No. 1