

SITE INSPECTION FORM

SITE NUMBER AND NAME: GP008 Road Surface Slumping (2.5 km North of McIntyre Mine)		HIGHWAY & KM: 40:36, 16.365 and 17.139	PREVIOUS INSPECTION DATE: July 21, 2021	INSPECTION DATE: June 14, 2022
LEGAL DESCRIPTION: SE 15-58-08-W6M SW 14-58-08-W6M SW 14-58-08-W6M NW 14-58-08-W6M	NAD 83 COORDINATES: UTM Northing Easting 11 5986982 362802 11 5987018 363134 11 5987028 363196 11 5987195 363778	RISK ASSESSMENT: West/South Slide PF: 8 CF: 4 TOTAL: 32 Middle Slide PF: 8 CF: 4 TOTAL: 32 East/North Slide PF: 9 CF: 5 TOTAL: 45 ATCO Slide PF: 8 CF: 4 TOTAL: 32		
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 820 (north) & 820 (south) (Reference No. 70000788, 2021)		CONTRACT MAINTENANCE AREA (CMA): 504		

SUMMARY OF SITE INSTRUMENTATION: Operable: Three slope inclinometer (SIs) and two pneumatic piezometers (PNs) installed in 2004. Inoperable: One PN installed in 2004. LAST READING DATE: June 23, 2022	INSPECTED BY: Chris Gräpel (KCB) Courtney Mulhall (KCB) Ed Szmata (AT) Kristen Tappenden (AT) Max Shannon (AT) Mike Schiffer (Ledcor HMC)
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PRIMARY SITE ISSUE: Three slides/slope failures in a possible mine-waste fill/dump below Hwy 40:36 at the west/southern site limit: west slide cuts diagonally across highway (WP190), middle slide confined to northbound lane and shoulder (WP193), and east slide encompasses both lanes (WP192). In 2022, ATCO slide to north (WP197) added to GP008 site. ATCO slide triggered by temporary bench constructed for powerline work and affects northbound lane of highway. The site is located along the west valley slope of the Smoky River. Rockfall component of this site made into a separate site (GP053) for rockfalls only.

APPROXIMATE DIMENSIONS: West/middle/east slides: Fill appears to be approximately 30 m high and could be an old mine-waste fill that predated highway construction. West slide at pavement surface approximately 60 m wide and 90 m long. Middle and east slides at pavement surface approximately 15 m and 140 m wide, respectively.

ATCO slide: The bench is approximately 6 m wide by 20 m long and 5 m below pavement surface with a 1H:1V backslope.

DATE OF ANY REMEDIAL ACTION: Ongoing patching and paving, including recent patching in 2021 at the west and ATCO slide areas.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Cracking in pavement surface at west, middle, and east slides, including in recent patch at west slide. Dip in pavement surface at ATCO slide.		X
Slope Movement	X		Four slides as described above. Cracking in recent pavement patch indicates ongoing slide movements. SI movement rates generally below 10 mm/year. Subtle changes in slope grading near bushes at northern slide could indicate a toe bulge.		X
Erosion		X	None observed at time of 2022 inspection.		X
Seepage		X	None observed at time of 2022 inspection.		X

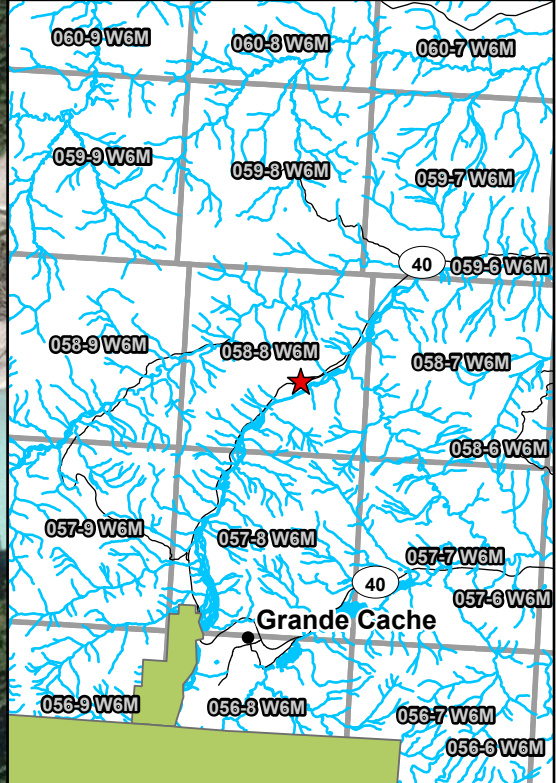
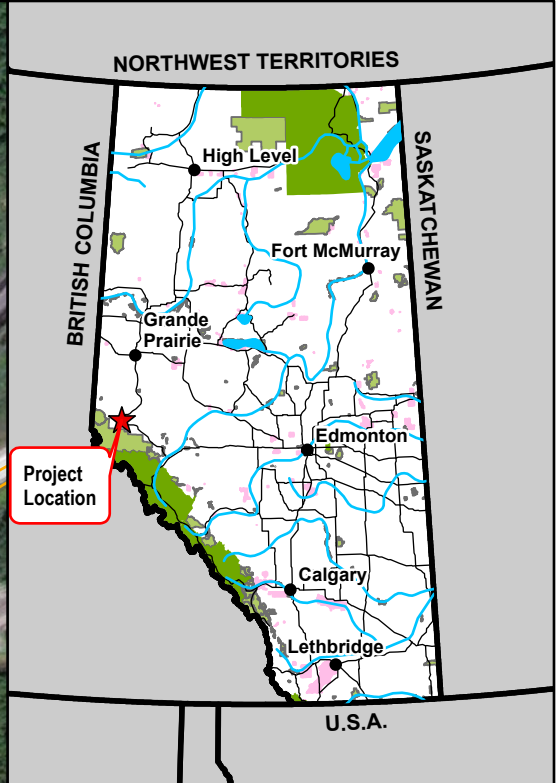
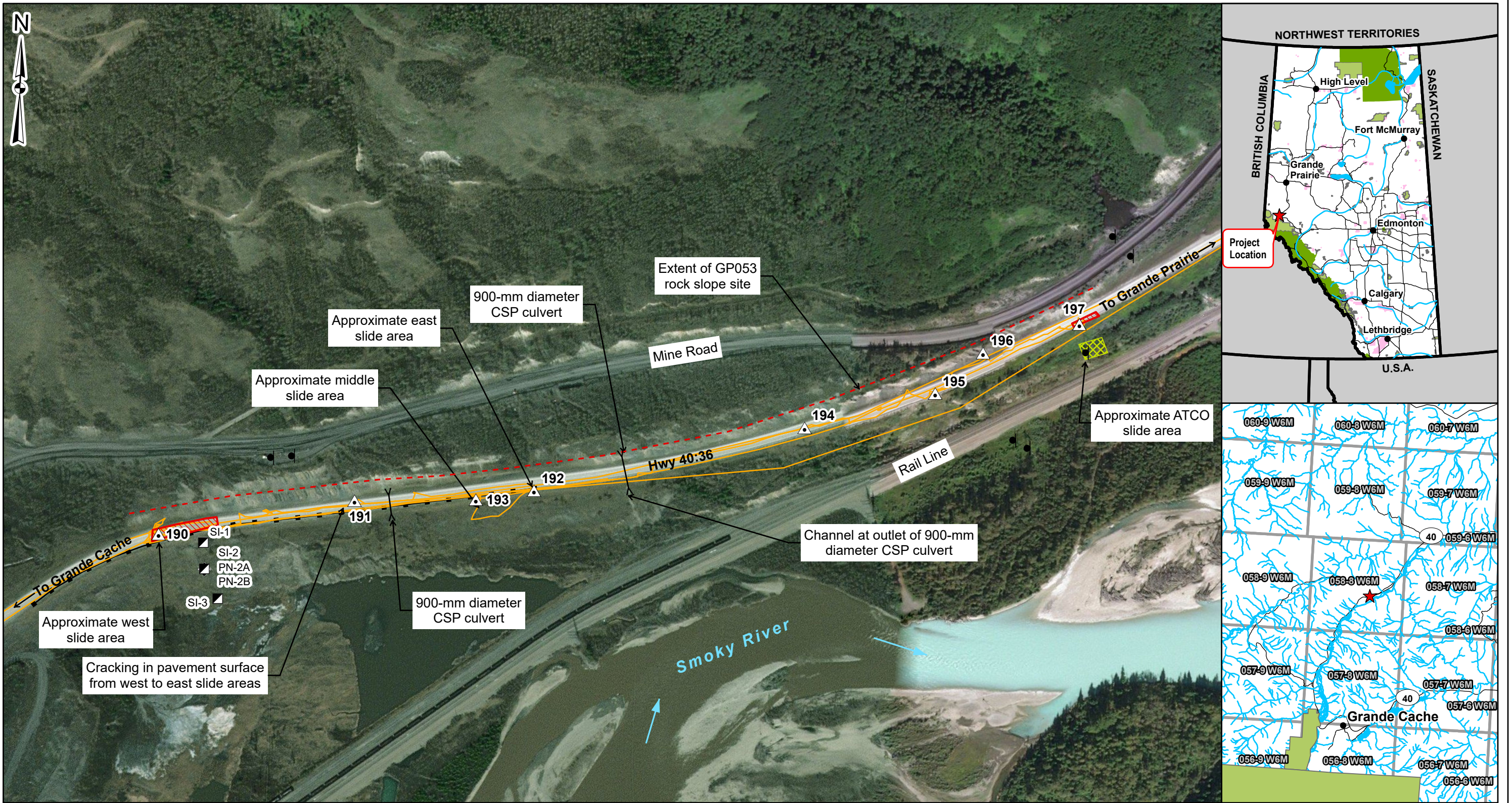
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Culvert Distress		X	Culverts not inspected, but no previous distress observed by KCB.		X
COMMENTS					
<p>AT says that pavement cracks from west (WP190), middle (WP193), and east (WP192) slide zones usually reflect through pavement patches very quickly.</p>					
<p>Pavement cracking at middle slide is about 15 m wide. The width of the slide as indicated by pavement cracking does not appear to indicate a large failure that extends far down the slope. The surface of the slope below the middle slide appears to be stable with the possibility of a toe bulge approximately 10 m downslope in the bushes that could also be a remnant from poor slope grading.</p>					
<p>Material exposed on slope below middle slide appears to be mine-waste material and could be from a former mine-waste dump that predates highway construction. There is several meters distance between the guardrail and the crest of the slope which could also indicate a former mine waste structure as opposed to a highway embankment fill. Mine-waste dumps are typically built-in thick lifts with minimal compaction by end dumping with haul trucks. Settlements of the embankment could occur with time that might explain the movements at the western site limits, as would sliding of the waste dump slopes on thin sloping layers of segregated and/or fine-grained waste-dump materials that become preferential drainage paths.</p>					
<p><u>Maintenance/Repair/Monitoring Recommendations:</u></p> <ul style="list-style-type: none"> • ATCO have constructed a temporary bench for powerline work on the downslope/east side of the highway embankment at WP197. The bench was constructed using a cut and sliver fill method, resulting in an over-steepened backslope and fill slope. The bench is approximately 6 m wide by 20 m long with a 1H:1V backslope. The over-steepened backslope has resulted in pavement cracking near the white line/shoulder of the northbound lane of Hwy 40:36. The stability of the slope below the bench is unknown, and it is immediately above the train tracks. AT would like to repair the ATCO slide and backfill the bench before the highway is paved. The repair could involve excavating and reconstructing the slide with geogrid-reinforced fill and drainage. Wolf willow observed on the highway embankment slope and along ATCO bench, which could be habitat for birds. A pre-disturbance nest sweep will be required. Estimated cost: \$150,000 to \$200,000. 					
<p>This report is an instrument of service of Klohn Crippen Berger (KCB). The report has been prepared for the exclusive use of Alberta Transportation (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.</p> <p>KCB has prepared this report in a manner consistent with the level of care, skill and diligence ordinarily provided by members of the same profession for projects of a similar nature at the time and place the services were rendered. KCB makes no warranty, express or implied.</p> <p>Use of or reliance upon this instrument of service by the Client is subject to the following conditions:</p> <ul style="list-style-type: none"> (i) The report is to be read in full, with sections or parts of the report relied upon in the context of the whole report. (ii) The observations, findings and conclusions in this report are based on observed factual data and conditions that existed at the time of the work and should not be relied upon to precisely represent conditions at any other time. (iii) The report is based on information provided to KCB by the Client or by other parties on behalf of the client (Client-supplied information). KCB has not verified the correctness or accuracy of such information and makes no representations regarding its correctness or accuracy. KCB shall not be responsible to the Client for the consequences of any error or omission contained in Client-supplied information. (iv) KCB should be consulted regarding the interpretation or application of the findings and recommendations in the report. 					

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(v) This report is electronically signed and sealed and its electronic form is considered the original. A printed version of the original can be relied upon as a true copy when supplied by the author or when printed from its original electronic file.

Chris Gräpel, M.Eng., P.Eng.
Senior Civil Engineer, Associate



Legend

- Powerpole
- ◆ Approximate Pneumatic Piezometer Location
- Approximate Slope Inclinometer Location
- ▲ GPS Waypoint (June 14, 2022)
- GPS Track (June 14, 2022)
- Flow Direction
- - - Rockfall Corridor
- Guardrail
- Culvert
- ▨ ATCO Excavation
- ▨ Pavement Patch

NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM ZONE 11N
 3. IMAGE SOURCE: 2022 MICROSOFT CORPORATION, 2022 MAXAR CNES, DISTRIBUTION AIRBUS DS

CLIENT

Klohn Crippen Berger

PROJECT	PEACE REGION (GRANDE PRAIRIE DISTRICT-SOUTH) GEOHAZARD RISK MANAGEMENT PROGRAM	
TITLE	Site Plan GP008 - Road Surface Slumping (2.5 km North of McIntyre Mine) Hwy 40:36, km 16.365 and 17.139	
SCALE	PROJECT No.	FIG No.
1:4,000	A05116A01	1

File: Z:\AEDM\A05116A01\ABT Grande Prairie South GRMP\400 Drawings\GIS\MXD\2022\2022 GRMP Figures_202425.aprx Date: Time: Creator: aharrison

Inspection Photographs

Photo 1 Overview of GP008 site on Hwy 40:36. West (WP190), middle (WP193), east (WP192), and ATCO slide (WP197) areas circled in black. Photo taken June 14, 2022, with unmanned aerial vehicle (UAV) facing northeast.

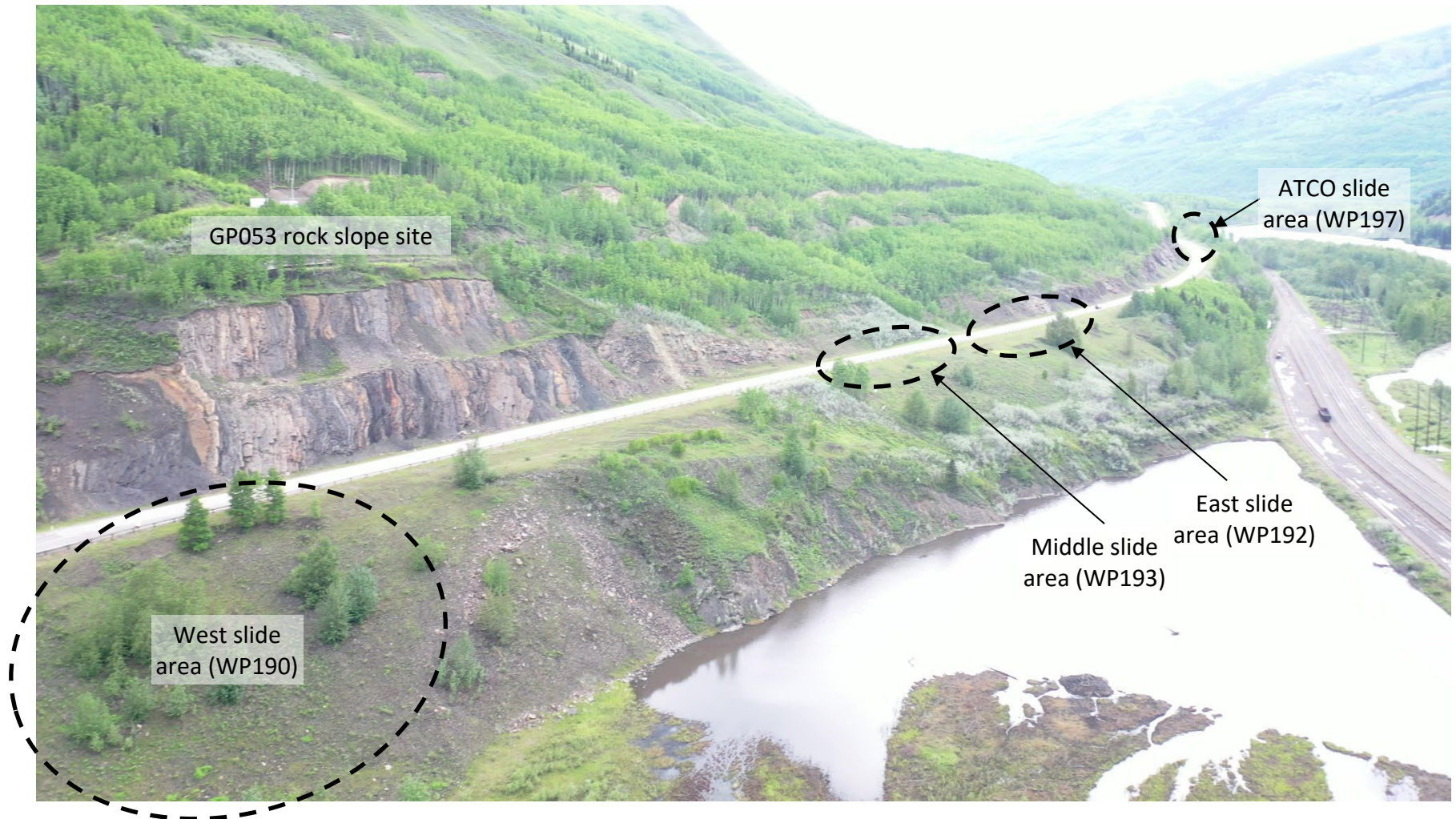


Photo 2 Overview of ATCO slide area (circled in black) at WP197. Photo taken June 14, 2022, with UAV facing north.

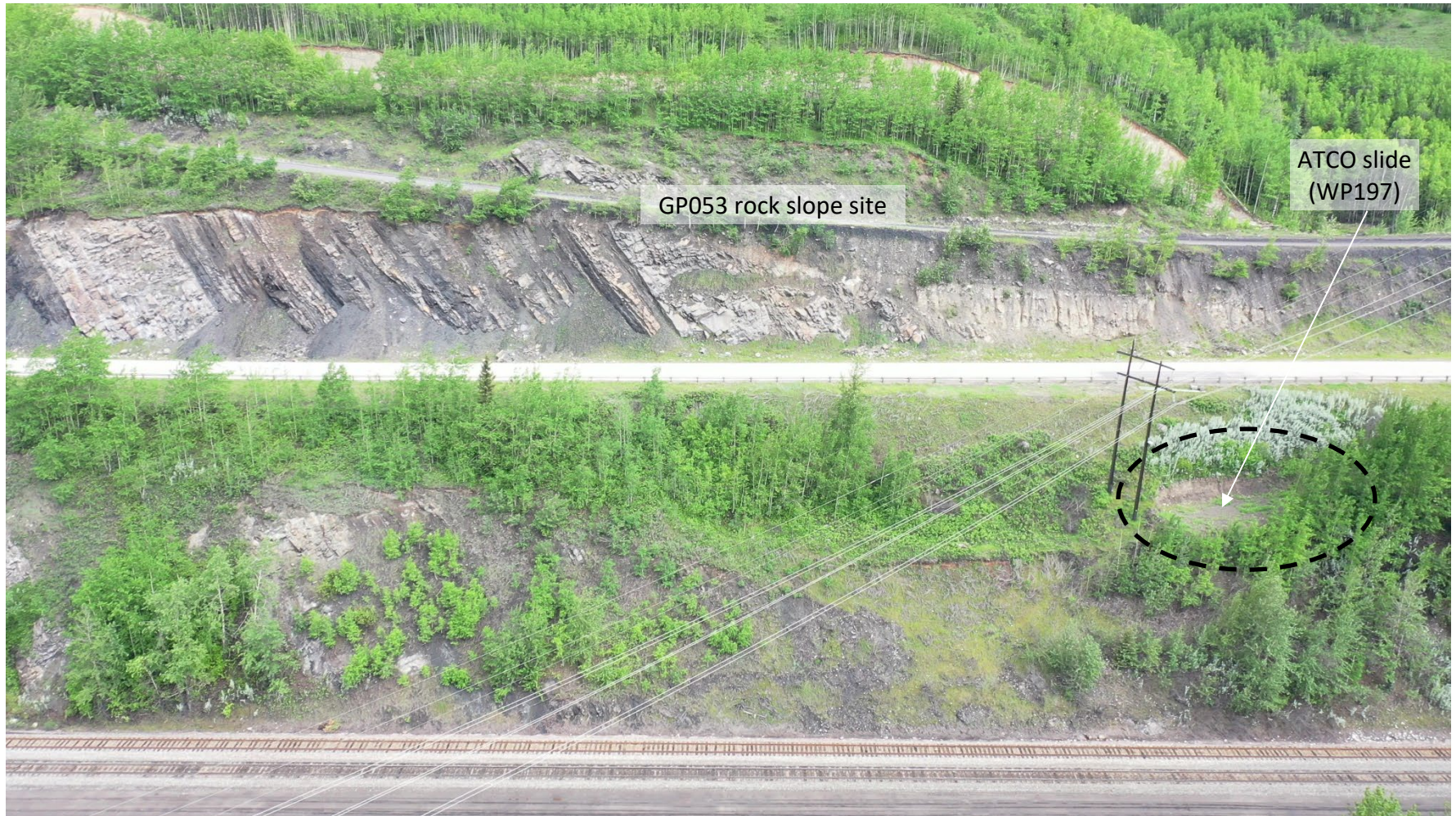


Photo 3 Cracking in pavement surface/patch of Hwy 40:36 above west slide area at WP190.
Photo taken June 14, 2022, facing east.



Photo 4 Cracking in pavement surface/patch of Hwy 40:36 above middle slide area at WP193.
Photo taken June 14, 2022, facing west.



Photo 5 Cracking in pavement surface/patch of Hwy 40:36 above east slide area at WP192.
Photo taken June 14, 2022, facing west.



Photo 6 Pavement surface/patch of Hwy 40:36 above ATCO slide at WP197
(downslope/south of blue highway marker). Photo taken June 14, 2022, facing
northeast.



Photo 7 Temporary access bench constructed by ATCO for powerline work on downslope/east side of Hwy 40:36. Photo taken June 14, 2022, facing south.



Photo 8 Temporary access bench constructed by ATCO for powerline work on downslope/east side of Hwy 40:36. Photo taken June 14, 2022, facing east.

