

EMERGENCY RESPONSE & MANAGING RISK - MATIRI WESTBANK ROAD SLIP

Prepared for **IPWEA Branch Meeting 21 February 2020**

February 2020

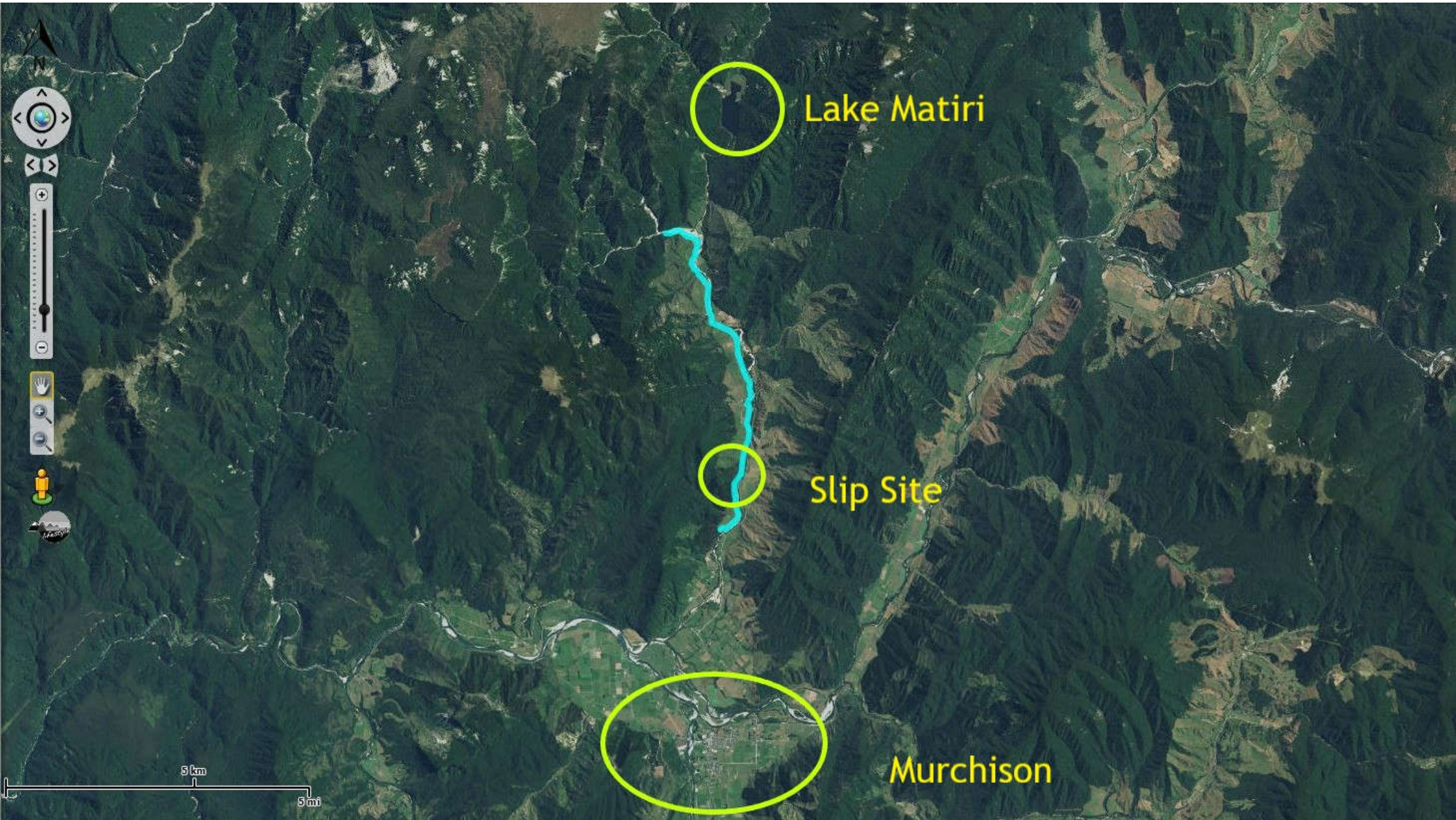
Brian McManus

Jamie McPherson



Location of Slip Site





Lake Matiri

Slip Site

Murchison

5 km

5 mi




1943


Retrolens.nz

MATIRI WEST BANK ROAD SLIP, DESKTOP STUDY

GEOadvice
Geology - Geotechnics

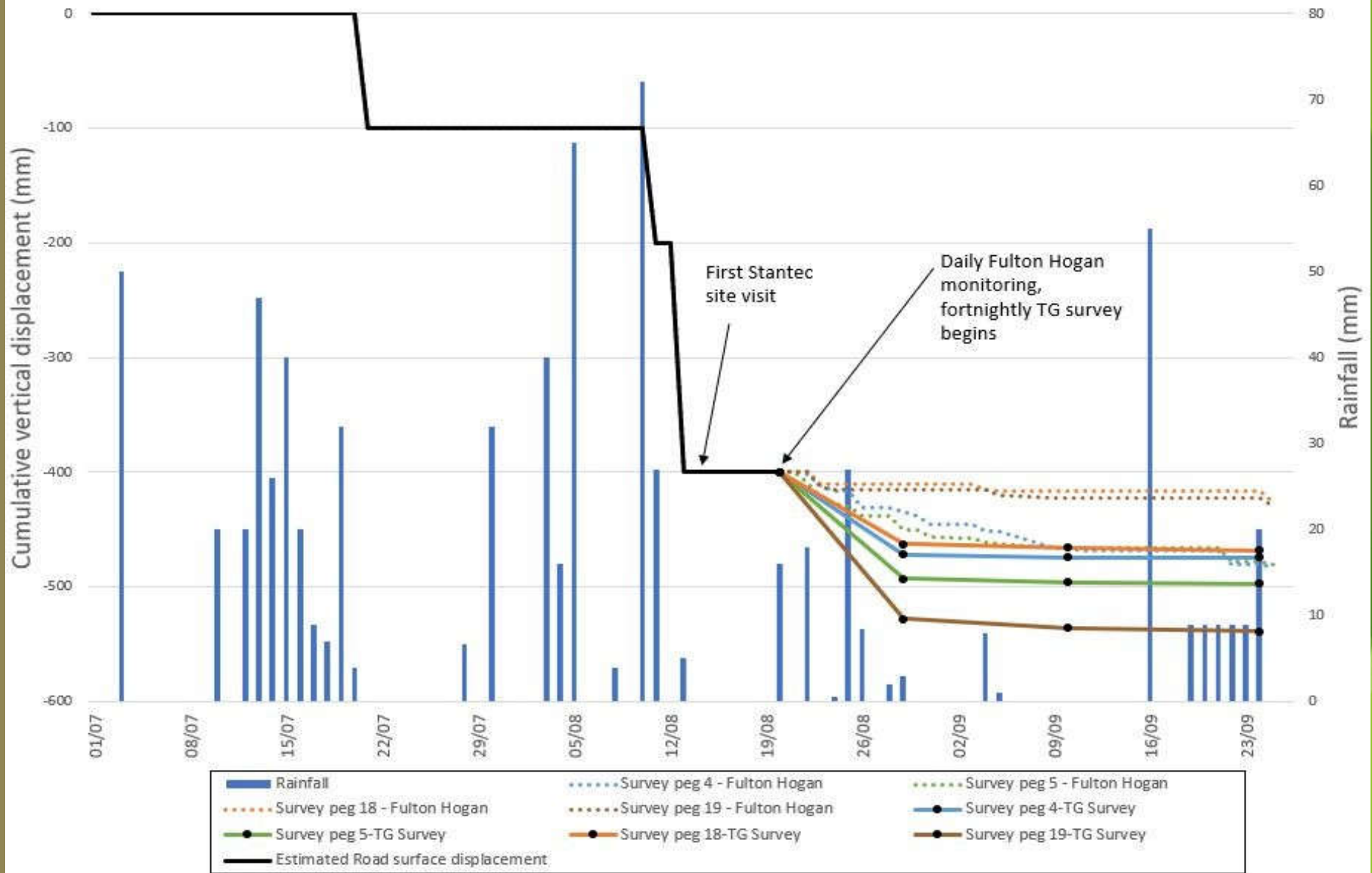
LEGEND:

 Approx. extent of slip 2019

 Active head scarps 1943

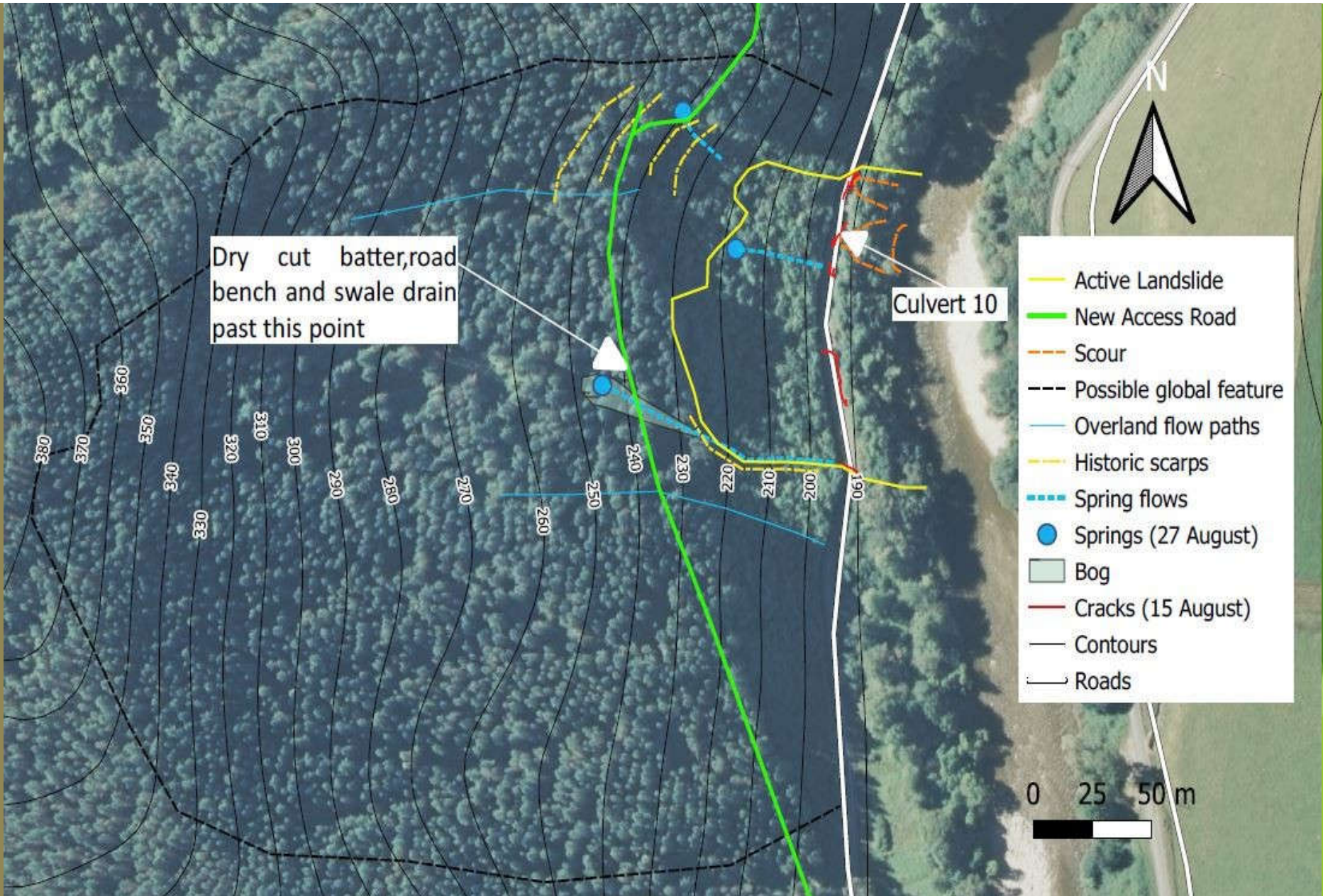


Cumulative vertical displacement of road surface and daily monitored survey pegs at Matiri landslide







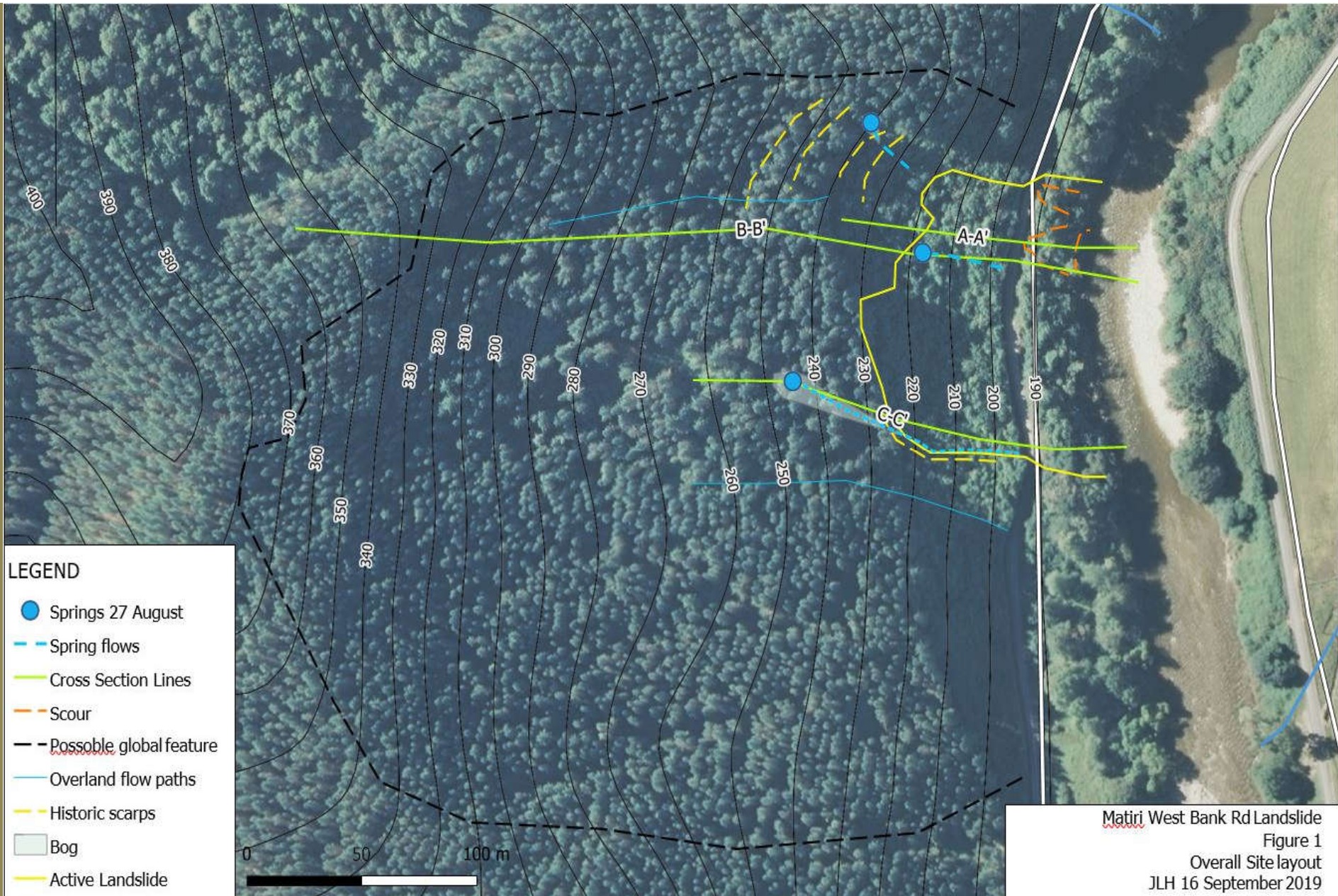


Dry cut batter, road bench and swale drain past this point

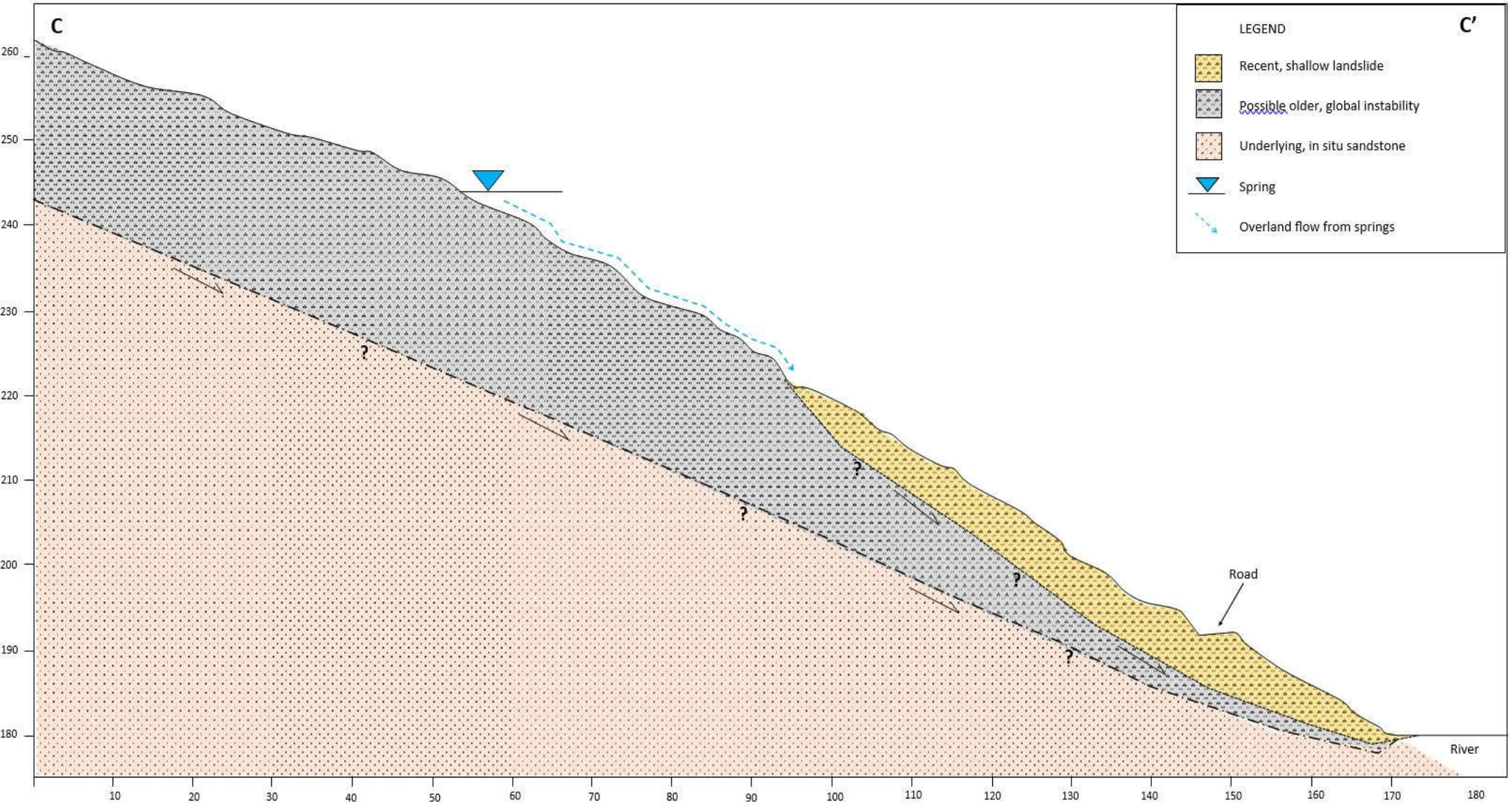
Culvert 10

- Active Landslide
- New Access Road
- Scour
- Possible global feature
- Overland flow paths
- Historic scarps
- Spring flows
- Springs (27 August)
- Bog
- Cracks (15 August)
- Contours
- Roads

0 25 50 m



Matiri West Bank Rd Landslide
 Figure 1
 Overall Site layout
 JLH 16 September 2019

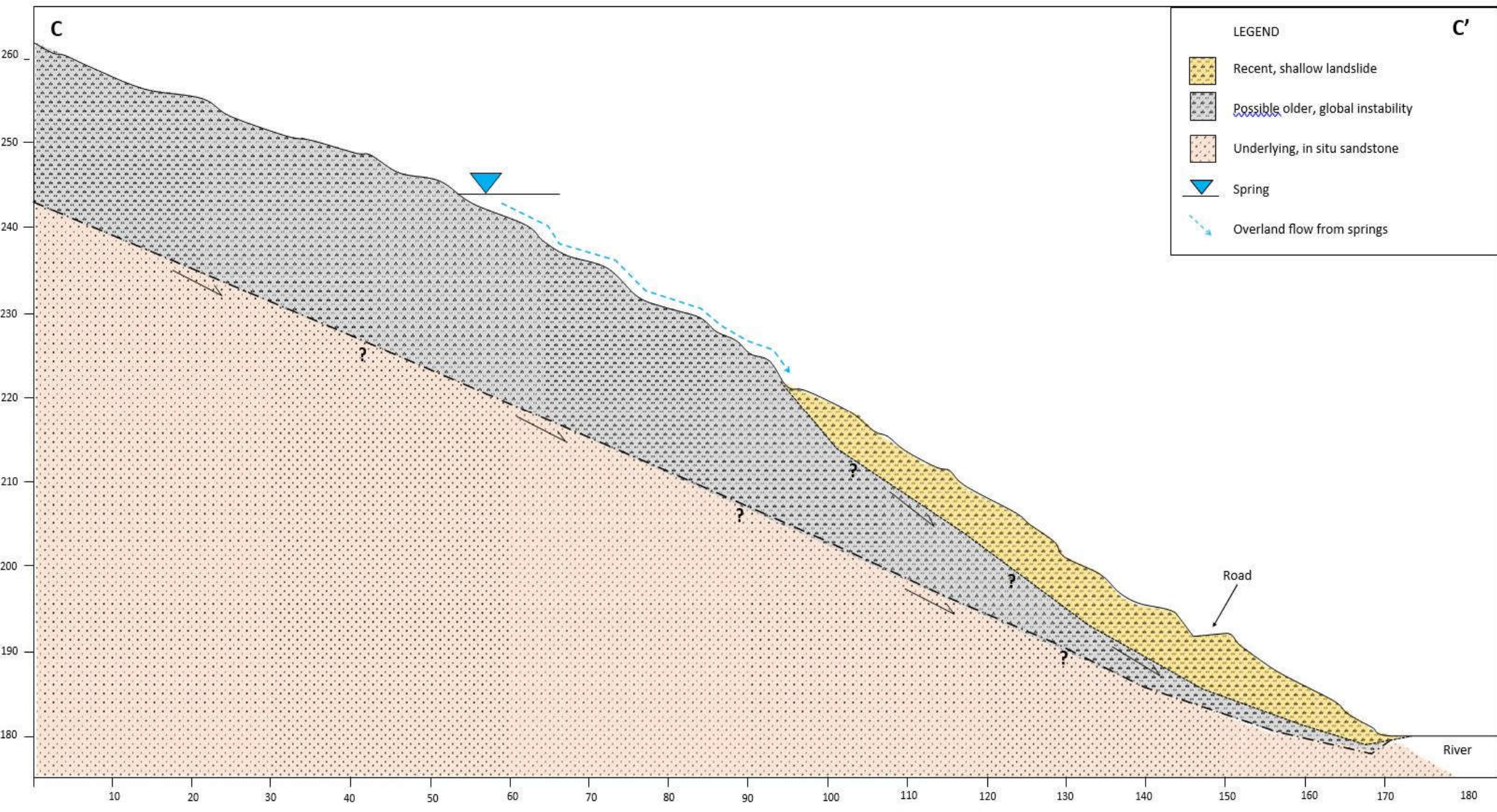












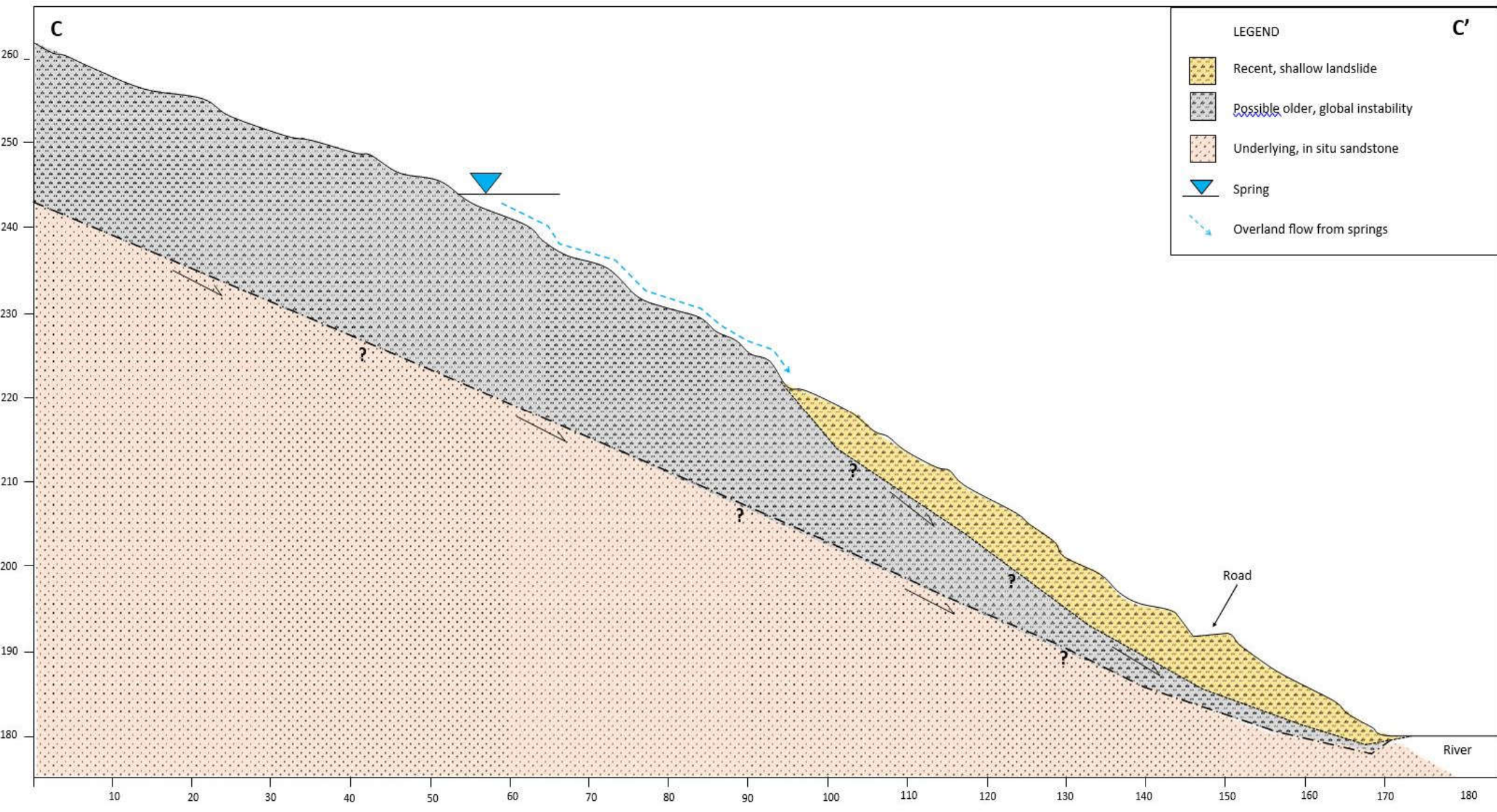


Drawn by: Sam Fournil
Surveyor: John Ball
Aerial Photography: Chris Waugh & Sarah

Scale: 1:400
22 Aug 2019 Original map size: A3

Date of Survey	Movement north/south in the 2 weeks between	Movement east/west in the 2 weeks between Heading	Vertical change in the 2 weeks between	Comment
16 August	Initial Survey	Initial Survey	Initial Survey	Movement aggregated across all pins
30 August	Range + 15 to - 16 mm	Range 144 to 247 mm towards river, typical 180mm,	Range -63 to -153 mm, typical 80 mm	Pins on outside edge at culvert moved and dropped further than others
12 September	Range 0 to -7 mm	Range -4 to +11 mm, most < 5mm, towards river	Range -1 to -8 mm, most < 4 mm	
26 September	Range 0 to 9 mm	Range - 6 to + 8 mm	Range - 3 to + 2 mm	Pin 16 has been knocked by a vehicle – result not included

Tasman Gowland have advised that the accuracy of the monitoring survey that is being undertaken is +/- 5 mm in X, Y and Z directions.



Options	Cost	Residual Risk
Do minimum	~\$minimal	No change Stability of large relic landslide is unknown
Do partial – localized retreat	~\$0.1 m	No change Stability of large relic landslide is unknown
Road retreat within landslide	~\$0.6m	No change (drainage effectiveness may reduce risk) Stability of large relic landslide is unknown Ongoing large cut batter instability/frittering requiring maintenance
Full Road retreat behind landslide	~\$1.5m	Ongoing large cut batter instability/frittering requiring maintenance Reactivation of relic landslide
Bailey Bridge at Turnbull farm	~\$1 m	Stability of abutment foundations, longevity of approach embankment
Bailey Bridge at Gorge	~\$1.5m	Stability of abutment foundations
Permanent Bridge	~\$2.0M	Very Low

Monitor Landslide
(topographical or telemetry survey, rainfall data capture)

Open Road
(under restrictions once monitoring criteria is met)

Carry out Road Retreat within Landside Option
(design and construction of RRWL option including localized retreat at underslips site)

Monitor
(Topographical/telemetry survey and rainfall data capture)

Close Road if movement is detected
(reset monitoring clock and criteria for reopening)
Repeat as necessary



Drawn by: Sam Fournil
Surveyor: John Ball
Aerial Photography: Chris Waugh & Sarah

Scale: 1:400
22 Aug 2019 Original map size: A3

Geotechnical 2nd Opinion.....





















Lessons Learnt.....

- Early stakeholder involvement is critical
- Open and honest discussions with stakeholders throughout the process
- Decision making protocols in place and all decisions clearly defined, captured and understood

The background features a large, solid brown rectangle on the left side. On the right side, there is a complex, abstract composition of overlapping, semi-transparent green shapes in various shades, ranging from light lime green to dark forest green. These shapes are angular and layered, creating a sense of depth and movement. The overall aesthetic is modern and minimalist.

Questions?