



Tauranga District Council
Private bag 12022
Tauranga

30 August 2022
Avalon Project #23043

For the attention of [REDACTED] s 6 - Maintenance of law

Dear [REDACTED] s 6 - Maintenance of law

Mauao Slopes;

Routine slope monitoring report August 2022 + Suspect boulder inspection above campground + New spring & adjacent boulder inspection

On 28 June, at your request, we visited Mauao to carry out the routine slope/rockfall walkover/photo survey and to inspect a boulder on the lower slope above the campground.

The boulder had been reported to [REDACTED] s 6 - Maintenance of law by a member of the public who believed it had recently moved.

On July 13 you requested us to visit to inspect a new spring which had recently opened up under the bush line, above the campground. A large boulder was present a few metres above the spring and there was concern the spring activity could destabilise the boulder.

On July 19 we visited Mauao to carry out the spring/boulder inspection and also completed the EDM survey of the Bluff movement monitoring locations.

1. The suspect boulder reported by public on 28 June

The boulder above the campground highlighted indicated in photo 1 does not appear to have moved recently. There is no indication of any recent disturbance in the soil or lichen.



Photo 1; Suspect boulder location above campground.



Photo 2; The boulder appears stable at present and has not moved recently.

2. The new spring & adjacent boulder inspection

The spring had opened up following storms in the week of 11 July. It was noticed by TCC staff on July 13. TCC Staff excavated around the spring to ensure it was not coming from a water main or artificial land drain.

Approx. Location = 1880181 5830443 or -37.630513, 176.174827



Photo 3; Location of the new spring & boulder.



Photo 4; Spring (after excavation to investigate).

Water flow had reduced down to a trickle at the time of our inspection on 19 July but there was scour and evidence that a significant amount of water had sprung and flowed down the gully below. There was vegetation damage and leaf litter washed out downstream.

Petrel nests are present around the boulder.

Over 20 almost years of monitoring we have seen ongoing evidence of the ways underground water flows through the lower soil slopes of Moau and the occasional opening and blocking of springs is consistent with previous observations.

The soil on the lower slopes comprises permeable pumice ash and permeable wind blown beach sand layers interbedded with impermeable clayey layers (highly

weathered ash). Rockfall boulders and smaller angular fragments of rhyolite are distributed through the soils. The soil profile has locally been disrupted and modified by many landslips (recent and ancient), this effect increasing in extent further down the slopes.

Water flows through the permeable layers and is blocked and redirected by the impermeable layers. Backing up of water can lead to significant hydrostatic/pore water pressures, which will be a contributing trigger to soil slips.

In places the flow has been seen sufficient to lead to open underground watercourses (piping) where less dense un-cemented soil has been washed out to the surface. Our August 2021 monitoring report contains details of one such (item 5).

The smaller of the underground flows probably change course relatively often as new flow paths form and others become blocked, particularly following intense and prolonged rain events.

The adjacent boulder lies immediately above the spring.



Photo 5; Boulder near spring.

The boulder appears well seated and it's stability is not currently being affected by the new spring. It appears stably seated with no evidence of significant scour or washing out under or around the boulder

We will include the spring as part of future monitoring visits.

3. Rockfall reported since previous monitoring

We understand that there has been no other rockfall reported to s 6 - Maintenance of law or campground since our previous monitoring.

4. Marginally stable rock noted above the Base Track

NZ Topo50 E:1879442 N:5830500

A relatively small rock been exposed by erosion. As it is immediately above the base track and clearly likely to fall soon it would be worth scaling to eliminate any hazard.



Photo 6; Small rock above base track

5. Ongoing erosion of soil face above Base Track

The same location as Section 6 of August 2021 report. This face has been scaled a number of times previously.

There is some new evidence of recent rockfall at the base. Ongoing erosion is evident on the face.

Recommend continue monitoring, worth considering for some scaling after significant rain fall or when a scaling team is on site for other works.



Photo 6; Eroding face above base track

6. Recent fallen trees above the Base Track

There is evidence of recent treefall in various places, but no evidence of significant associated rockfall in these locations.



Photo 7; Treefall.

7. Oruahine Track Rock Climbing Areas

We noted that only first bolt of each climbing route has been chopped, and some routes missed entirely.

8. 4WD Track

Recent planting noted in 'top paddock'



Photo 8; Recent planting

9. Bluff survey

The benchmark survey found no significant recent movement on the high bluffs which are monitored.

10. Photographic Survey

Previous monitoring locations A to M were photographed for the final time. No visual evidence was found of recent movements or rockfall activity.

These locations have been used since 2002 but will no longer be used due to vegetation growth now obscuring most items of interest on the slopes.



Photo 9; Vegetation well established and now concealing slope areas previously being monitored.

If you have any queries please don't hesitate to contact me.

Regards

s 7(2)(a) - Privacy