



PH. 07 846 1686 / FX. 07 846 1016  
PO. BOX 5187 / FRANKTON / HAMILTON / NEW ZEALAND  
[WWW.AVALONLTD.CO.NZ](http://WWW.AVALONLTD.CO.NZ)

GEOTECHNICAL

Tauranga District Council  
Private bag 12022  
Tauranga

25 October 2012

For the attention of [REDACTED]

Dear [REDACTED]

### **Mauao Slopes; Monitoring Report for September 2012**

This letter is to report on survey benchmark monitoring and the site geotechnical walkover completed on 27 September. Our previous monitoring was in April 2012.

#### **A) Routine work items completed at this monitoring included:**

- Discuss developments with [REDACTED]
- Walkover reviewing slopes from all tracks. Spring flows, slip movements, rockfall evidence, vegetation development etc. Recorded and photograph.
- Laser EDM survey carried out at 6 benchmark group locations on; West, North, East Bluffs and Zone 6.
- Sets of photos from locations A to M around summit for scour monitoring.
- Check previous slip sites re-vegetation, stability and tension crack development.

#### **B) Summary of routine findings:**

- No significant rockfall or slip events have been reported to or observed by Ranger staff since the previous monitoring.
- No significant movement of the benchmark surveyed bluffs.
- The 2011 slip scars are in places revegetation but in others are continuing to 'settle down' with minor reactivation.
- This walkover (as usual) found occasional evidence of recent minor rockfall, which is as would be expected (small rock fragments on tracks & rearrangements on bluff ledges).
- Erosional scour continues as anticipated on steep colluvial ground where there is little vegetation cover and exposed sand.
- The weed spraying operations can locally expose the colluvium to increased scour and, if necessary, should be as controlled as possible.
- Barren sand can scour quickly and exposed rocks on over steep ground above tracks pose obvious risks.

#### **B) Comments**

As usual we have chosen a few areas on which to comment specifically:

A slip over the base track just to the north of the campground has recently reactivated, resulting in a debris flow over the track and track closure, see photograph below. We understand this will be cleared when the material dries out a little and becomes easier to handle.



Since the last monitoring and subsequent meeting to discuss the new chalet locations, two of the chalets in the highest rockfall risk locations of the campground have been moved to less at risk locations.



The photograph above is a boulder which appears to have rolled forward within the last few years (note lichen line where left side was previously burried).



The section of slope in the photograph above, on the northern base track, has been active for many years. The photograph below is a rock which appears to have fallen from here recently.



This section of slope probably currently represents the highest concentration of rockfall risk to the base track. We would recommend that on the next monitoring visit this slope be scaled by the rope access team and assessed in more detail.



The photograph above is of a rock noted adjacent to the northern Oruahine track, probably fallen from above. We have always judged this to be the highest risk of all the tracks and continue to advocate that persons be strongly discouraged from moving around on the slopes above, which have much loose surface rock.

The photograph below is of steep ground directly above, where extensive scour and loose rock can be seen.



Please find appended our survey benchmark monitoring data, which did not indicate any particular issues.

In conclusion we are pleased to report that no unexpected hazards or issues were found on this monitoring visit.

The rockfall risk continues as previously and all persons using the tracks are of course exposed to some risk, however, the risk appears to be acceptable so long as the rockfall triggers which can be managed are managed (particularly persons moving around on the steep, loose upper slopes) and the weed spraying activities and rabbits are controlled to minimise scour exposure.

Please report any slips and/or rockfall events as soon as possible and we can incorporate them into the next monitoring visit or investigate immediately if required.

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

Regards

s 7(2)(a) - Privacy



Area 1a; "Camp Bluff"

1a - The Camp Bluff



Distance measurement mm

	Nov-03	Jan-04	Nov-04	Mar-05	Dec-05	Mar-06	Nov-06	Jul-07	Nov-07	Nov-08	Jun-09	Dec-09	Jun-10	Dec-10	Jul-11
3 → 4		5211	5209	5208	5208	5207	5208	5215	5210	5207	5208	5212	5209	5210	5206
3 → 5		4320	4320	4321	4321	4320	4323	4323	4319	4322	4322	4324	4324	4324	4320
3 → 6		5179	5180	5178	5178	5180	5181	5178	5178	5178	5180	5182	5183	5182	5178
4 → 5		2258	2260	2260	2260	2260	2260	2258	2259	2261	2260	2262	2263	2262	2263

Mar-12 Sept 12

3 → 4	5214	5206
3 → 5	4327	4320
3 → 6	5171	5182
4 → 5	2262	2263

Area 2a; "Blasted Column"

2a - Column



	Nov-03	Jan-04	Nov-04	Mar-05	Dec-05	Mar-06	Nov-06	Jul-07	Nov-07	Nov-08	Jun-09	Dec-09	Jun-10	Dec-10	Jul-11
8 → 11		7917	7910	7907		7906	7915	7905	7906	7905	7910	7913	7913	7910	7912
8 → 9			9968	9969		9970	9968	9968	9964	9973	9971	9971	9968	9963	9966
10 → 8			3111	3111		3112	3126	3126	3126	3114	3114	3113	3115	3113	3115
10 → 9			11636	11636		11633	11635	11634	11634	11634	11630	11636	11636	11637	11632
10 → 11			8325	8325		8325	8325	8325	8320	8327	8325	8326	8323	8330	8334

Mar-12 Sept 12

8 → 11	7908	7912
8 → 9	9963	9964



14	→	17	8129	8130
15	→	17	5061	5056
16	→	17		4880
15	→	16	3572	3572
15	→	14	7485	7490

**Blocks above Area 3d**

North Promontary

Block 5d



		Mar-03	Nov-03	Nov-04	1/03/20C	Dec-05	Mar-06	Nov-06	Jul-07	Nov-07	Nov-08	Jun-09	Dec-09	Jun-10	Dec-10	Jul-11
18	→	19	5248	5265	5256	5256	5254		5253	5253	5255	5256	5255	5257	5254	5256
20	→	19	3380	3385	3373	3376	3376	3377	3375	3374	3376	3379	3378	3377	3378	3379
20	→	18	8038	8065	8050	8056	8050	8053	8053	8054	8057	8056	8062	8057	8052	8055

Mar-12 Sept 12

18	→	19	5248	5257
20	→	19	3378	3382
20	→	18	8050	8056

**Zone 6 Boulder 6b**

23 (LH outcrop) 22 (RH Outcrop)

21 (boulder)

			Dec-05	Mar-06	Nov-06	Jul-07	Nov-07	Nov-08	Jun-09	Dec-09	Jun-10	Dec-10	Jul-11
21	→	23	7560	7590	7615	7663	7639	7649	7655	7659	7660	7665	7671
21	→	22	5799	5830	5865	5999	5891			5911	5914	5920	5929

Mar-12 Sept 12

21	→	23	7679	7699
21	→	22	5939	5959