

## McCrae landslides

Board of Inquiry (BOI) request for input by August 22, 2025

Landslide prevention and risk reduction submission

21 August 2025

In response to the BOI request dated 15 July 2025 requesting submissions on

*‘...measures required to prevent or reduce the risk of a further landslide...’*

The following submission is from the owners of the property at 10-12 View Point Road.

### Background

#### Landslide Prevention

Preventing a landslide from occurring in the McCrae area while technically possible, would require dramatic and expensive actions, which are not practical nor consistent with how humans interact with natural risk areas and generally accepted community risk tolerance.

Prevention, from a risk perspective, is essentially the same as reducing the probability alone of a landslide to zero. This would require reducing the steepness of the entire scarp, removing human development, ensuring no water (anthropogenic or from natural sources) could enter the scarp area, reinforcing the entire scarp or replacing the scarp face with stable material, or a combination of the above.

#### Landslide risk reduction

Assuming the broadly accepted practices of risk assessment and management are applicable to this environment and the questions at hand, the principle that risk can be assessed as the product of two key factors, probability and consequence applies.

To reduce risk, a series of mitigation actions (for both the probability and consequence factors) can be adopted until the cost of the additional actions becomes prohibitive, or the incremental reduction in risk becomes inconsequential, or the risk reaches an acceptable level. Broadly speaking, mitigation actions that focus on prevention are better than mitigation actions that reduce the implications of a landslide.

In general terms, an annual risk to life of 0.0001 (the chance of being killed by a landslide each year being 1 in ten thousand) is considered a tolerable level of risk in Australia (AGS 2007).

### **Reducing the probability of occurrence of a landslide**

Landslide hazards that exist in the McCrae area vary in size and type depending on the soil properties, drainage, surface loads, natural stabilization, geography and underlying geological features. A larger landslide hazard may exist in a natural gully that has been filled with colluvium or fill over many years, compared to a smaller landslide hazard on a prominent point or headland between two gullies with limited overlying topsoil.

To assess the risks associated with individual properties, specific landslide hazards need to be determined, and a risk assessment conducted for each specific property.

### **Steps that can be taken to reduce the probability of a landslide in the McCrae area include, where practical:**

1. Reducing the risk of water, the primary cause of landslides, entering the fragile escarpment
  - a. Improving the understanding of natural geographic and geological features and flow paths (natural drainage pathways, shallow channels in dispersive soils, permeable material in natural gullies) and ensuring utility and domestic development reflects the risks associated with development around these natural features
  - b. Removing water-bearing utilities and trenches from the scarp area
  - c. Adopting a higher standard of design, surveillance and maintenance for water-bearing utilities and trenches in the escarpment area
  - d. Using technology to detect unexpected groundwater changes and water releases (bursts, leakage) that enables rapid investigation and response.
2. Natural solutions to increase slope stability
  - a. Ensuring the gradient of the escarpment is maintained to the highest degree of slope stability achievable
  - b. Replacement of unstable or undrained material with more stable and well drained materials, such as rock fill.
3. Engineering solutions that strengthen the escarpment
  - a. Retaining walls, nail and netting, shotcrete, etc.

- i. Engineering solutions have a design life and require maintenance which makes these choices less preferable to 'natural' solutions, however where natural solutions cannot be adopted or are prohibitively expensive, engineered solutions should be considered.

#### 4. Managing anthropogenic impact

- a. Development and planning controls that manage the impact of human development on landslide risk.

### **Reducing the consequences of a landslide**

For each landslide hazard applicable to a specific property, the consequences of the landslide occurring can be assessed. While damage to property (financial loss) is a consideration, a more common approach is to consider the risk-to-life (RTL) associated with a landslide event. The RTL is usually assessed for the individual who is 'most at risk', for example, the permanent residents of a property are more at risk than gardeners who would only attend a property for a short period.

### **Steps that can be taken to reduce the consequence of a landslide in the McCrae area include, where practical:**

1. Keep people away from landslide risk areas
  - a. If people are not present, there can be no RTL. If people are only present for short periods, their exposure to landslide hazards and their RTL is reduced
  - b. Adopt Development and Planning controls that limit where people can build homes and occupy spaces, depending on a landslide risk assessment
  - c. Early warning systems that detect immanent landslide threats, that can be used to inform decisions to escalate monitoring or evacuate at-risk areas, similar to bushfire risk management practices.
2. Engineering solutions that protect people from landslides

- a. Landslide resistant structures, gabion walls, retaining walls, energy absorption or diversion barriers to protect people from the consequences of a landslide.

## Summary

Measures that could be adopted to prevent or reduce the risk of further landslides in the McCrae area include:

1. Enhanced surveillance and maintenance of aging infrastructure owned and operated by South East Water and Council, based on risk assessment and management principles
2. Landslide risk assessments for the properties in the vicinity of the scarp, including recommendations for risk mitigation actions, addressing both probability and consequence factors
3. Development and Planning controls that assess the impact of human development on the natural environment, and seek to limit the impact of development impacting natural features such as drainage pathways
4. Use of technology to detect natural groundwater changes and unexpected water releases from domestic and utility infrastructure, to drive response actions
5. Enhanced incident response times (ie: the definition of 'category 1' incidents) for unexpected water releases or groundwater changes within a 'critical zone' as determined by landslide risk assessment
6. Structured and formal annual emergency management exercises (drills) led by Council to test their lead role and capacity to respond to a landslide, and their plan for appropriate use of legislative powers in responding to such incidents. Such exercises should test:

- a. Lead responsibility and interfaces with other agencies (Police, SES, etc)
- b. Crisis response team positions and training
- c. Pre-documented response actions and priorities
- d. Legislative authority and boundaries
- e. Communication with Impacted residents, the public and media
- f. Access to emergency funding
- g. Access to experts via standing 'call out' agreements
- h. Incident response room(s) and amenities
- i. 24/7 and extended period personnel coverage plans
- j. Documentation of lessons learned for Council Board review and oversight