

Memo: Response to Geomorphic Risk Assessment Information Gap

To: Auckland Council

From: James Kitchen & James Beaumont

Date: 2025/07/01

Subject: Response to Request for Geomorphic Risk Assessment

Introduction

This memo outlines our position that a Geomorphic Risk Assessment (GRA) is not warranted for the proposed Delmore development site. The current geotechnical and ecological assessments, combined with a stormwater and slope stabilisation design, adequately manage the risks typically associated with the riparian setbacks provided and hillside development of this nature.

The proposed T-bar outlets and mechanically stabilised earth (MSE) batters are common and accepted engineering practices in Auckland and have been specifically tailored to this site's characteristics. These systems are designed to mitigate erosion, manage stormwater, and ensure slope stability without the need for further geomorphic investigation.

1. Background and Context

The Auckland Council planning review identified an "Information Gap" concerning riparian setbacks, suggesting that a GRA may be required due to steep terrain, complex geology (e.g., Northland Allochthon), and dynamic watercourses.

While we acknowledge these site conditions, we do not agree that they warrant a GRA. The following sections address the rationale for this position.

2. Supporting Technical Commentary

- **Long-Term Channel Stability**

Historical aerial imagery shows no evidence of stream meandering or lateral channel migration over the last 30 years. The channels exhibit long-term stability under current hydrological regimes. Aerial data does not show signs of migration of streams. This is with the site being largely pastoral land, which is different to the proposed stream margins which will be planted with native vegetation, ie less prone to erosion than the current state. If there was risk of streams migrating, which would require an additional width of riparian zone, then you would expect to see the streams in noticeably different locations 30 years ago.



Figure 1- 1996 aerial photograph of Delmore site. Source: Auckland Council GIS



Figure 2 - 2025 image of Delmore site. Source: Auckland Council GIS

- Comparable Site Evidence – Ara Hills**

A site visit to the Ara Hills development (undertaken June 2025), which shares similar soils, topography, and geotechnical context, found no visible evidence of stream significant erosion. This supports expectations of similar behaviour on the subject site.



*Figure 3 - Streams in Ara Hills catchment, showing no significant signs of meandering and erosion where inspected.
Source: McKenzie & Co site visit, June 2025.*

- **T-Bar Outlet Design**

The T-bar outlets are designed to discharge sheet flows onto mechanically stabilised, vegetated earth bunds. This setup is intended to disperse flows, dissipate energy, and avoid erosion. This regime replicates natural overland stormwater movement.

- **Established Engineering Practice**

The use of T-bars in this manner is standard practice across Auckland. They are not typically accompanied by geomorphic risk assessments, and are specifically chosen to avoid the concentrated flows that can elevate erosion risk. By contrast, piped or channelised systems often necessitate such reviews.

- **Geotechnical Engineer's Advice**

The following expert advice from Riley Consultants confirms the efficacy of the T-bar design:

“The T-bars are designed to discharge sheet flows rather than concentrated flows onto the mechanically stabilised and vegetated batters. These are designed to dissipate energy to minimise the erosion risk. They will need to be appropriately designed to ensure that they achieve this outcome and the slopes will need to be well vegetated.

The use of T-bars is a common practice across the Auckland area to disperse stormwater flows and dissipate energy.”

Further, the soils are considered to have a low susceptibility to erosion owing to the composition of their constituents. Any Northland Allochthon rock that is exposed during the works will be over-excavated and capped with compacted clay fill to protect it from exposure to surface water flows.

- **Natural and Engineered Containment**

The site's steep gullies and constructed bunds form containment features that naturally restrict stream migration and bank retreat. These landscape features reduce the necessity for variable setbacks based on geomorphic sensitivity.

- **Improved Erosion Resistance**

The current grass pasture is more erosion-prone than the proposed stabilised and vegetated batters. The development will therefore deliver a net improvement in erosion resistance and slope stability.

- **Catchment Characteristics**

The contributing catchments are small and relatively flat, as shown by the presence of stable wetland areas. This confirms low flow velocities and therefore a low risk of erosion or geomorphic alteration.

- **Retention of Natural Watercourses**

The development maintains the existing alignments of all natural flow paths. There is no intention to realign, modify, or channelise these watercourses, which removes the most common driver for geomorphic instability.

- **Ongoing Risk Management**

An inspection and maintenance regime is proposed for outlet structures and riparian margins to ensure continued performance and early detection of any localised issues.

3. Mechanically Stabilised Earth (MSE) Batters

The use of geo-reinforced (MSE) batters plays a critical role in stabilising steep slopes. These structures incorporate engineered fill and reinforcement layers, combined with vegetative cover, to prevent failure and surface erosion. MSE batters:

- Offer high resilience to rainfall and stormwater runoff;
- Are commonly used in areas with steep terrain and weak soils;

- Integrate well with T-bar sheet flow dispersion; and
- Reduce the likelihood of gully or bank erosion adjacent to riparian areas.

Their inclusion is an important reason why additional geomorphic studies are unnecessary.

Conclusion

The proposal incorporates well-established engineering techniques to manage both geotechnical and hydraulic challenges. Consideration of the below has informed McKenzie & Co's position that no Geomorphic Risk Assessment is required:

- Long-term stream stability evidence;
- Mechanically stabilised and vegetated slopes;
- Sheet flow T-bar outlet design; and
- Existing expert geotechnical assessment and advice.

There is no material basis for requiring a Geomorphic Risk Assessment, as the development does not introduce any new drivers of geomorphic change. On the contrary, the design improves existing conditions and aligns with accepted Auckland-wide engineering standards.

We respectfully recommend that the request for a Geomorphic Risk Assessment be set aside in light of the information presented.