

27 February 2019



Rotokauri North SHA

c/- Renee Fraser-Smith

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HD631 – Rotokauri North SHA – Response to HCC Peer Review

Dear Renee,

I understand that Council's peer reviewer has further questions regarding the liquefaction hazard at the Rotokauri North SHA. My understanding is that at plan change stage, we shouldn't need to provide detailed information on how we are to mitigate the risk (that will be done at later stages of the development design and consenting). The test is whether there is anything there that should preclude the site being zoned for development. To my mind, an appropriate test of this (in relation to liquefaction) is whether there are similar local areas that have recently been developed. There are several such examples locally that have been developed under the current guidance (noting that liquefaction assessment practice has changed significantly in the last 10 years). In our report we have highlighted that there is a liquefaction hazard that needs consideration and, at the subdivision suitability stage, we are aware that we will have to provide detailed information on our mitigation approach to meet the requirements of s106.

To answer the specific questions provided to us:

Further information is required from the applicant to substantiate the conclusion that mitigation of the moderate to severe liquefaction risk is achievable. The further information should demonstrate that the liquefaction risk can be managed at subdivision/land use stage.

The terminology 'moderate to severe' is based on the LSN categories. Based on the MBIE planning guidance, the category for the susceptible areas of the site is generally 'Medium' liquefaction vulnerability with some areas that may be categorised as 'High'.

We based our conclusion that the site is appropriate for development on:

- We have been involved in or have reviewed the assessments for several other sites in Hamilton. The assessed hazard on this site is equivalent to many of the recently developed suburbs in Hamilton including Rotokauri, Rototuna North and Ruakura.
- All of these areas have been assessed for liquefaction and various mitigation has been recommended and implemented during construction.

- The site is assessed as roughly the equivalent of TC2 land in Christchurch. Such land has been, and is, regularly developed.

We note that there is no regional or district policy that sets a framework for accepting/rejecting development based on liquefaction risk and so current practice is a good measure of suitability.

The extent of the liquefaction hazard should be discussed.

The area of the site with geology/geomorphology that indicates it may be subject to a liquefaction risk is the Plains, which covers most of the site. The site geomorphology plan in our preliminary report (attached) identified these areas. While there is variation in the assessed hazard, our study identifies that liquefaction damage is likely across the Plains area and the likely hazard ranges from **Medium** to **High** liquefaction vulnerability. Liquefaction is not a hazard in the Hills areas of the site.

Feasible measures that might be employed to mitigate the risk should be identified and discussed.

Mitigation in the recently developed parts of Hamilton that have a liquefaction hazard included measures such as

- shallow ground improvement (to separate structures from liquefiable layers)
- reinforced raft foundations (varying from simple ribraft to reinforced, resilient raft foundations)
- piles to non-liquefying layers
- de-watering to reduce the hazard (usually locally to a lateral spreading hazard)
- setbacks or barrier piles in some locations where lateral spreading was considered to be a risk

The MBIE planning and engineering guidance for potentially liquefaction prone land asks for a Level B assessment at plan change – we have exceeded this with a Level C Area-wide study.

Please let me know if you have any further questions.

Kind regards,



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Technical Director

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-  Plains
-  Hill Terrain

PROJECT: Rotokauri North SHA	
PROJECT NO: HD631	
CLIENT: Green Seed Consultants Limited	
TITLE: Site Geomorphology	
SCALE: NTS	
Drawing No: HD631/2	
Drawing by: MM	
Rev Number	
0	Initial