

**BEFORE THE HEARINGS PANEL  
FOR THE QUEENSTOWN LAKES PROPOSED DISTRICT PLAN**

**UNDER THE** Resource Management Act 1991 ("**Act**")  
**IN THE MATTER OF** Stage 3 Proposed District Plan – Settlement Zone  
**BETWEEN** **CARDRONA VILLAGE LIMITED**  
Submitter 31019, and Further Submitter 31066  
**AND** **QUEENSTOWN LAKES DISTRICT COUNCIL**  
Planning Authority

---

**EVIDENCE OF MICHAEL DAVID LEE IN SUPPORT OF  
THE SUBMISSION OF CARDRONA VILLAGE LIMITED**

**29 MAY 2020**

---

---

Counsel instructed:

**JGH** BARRISTER

J D K Gardner-Hopkins

Phone: 04 889 2776

[james@jghbarrister.com](mailto:james@jghbarrister.com)

PO Box 25-160

**WELLINGTON**

## **PROFESSIONAL DETAILS**

### **Qualifications and experience**

1. My full name is Michael David Lee.
2. I am a Chartered Professional Engineer and a Director of Airey Consultants Ltd. I hold a degree of Bachelor of Engineering, a Diploma in Highway Engineering and am a member of the Institution of Professional Engineers of New Zealand. I have over 30 years' experience in the design consents and construction management of infrastructure for land development and other civil engineering projects.
3. I attach a copy of my CV and statement of my relevant experience as **Attachment A**.

### **Code of conduct**

4. Although this is a Council hearing, I confirm that I have read the Code of Conduct for Expert Witness contained in the Environment Court Practice Note and that I agree to comply with it. This is subject to the fact that I have an interest in land on Rivergold Way, which is subject to the proposed Settlement Zone; and, in light of that interest, I made a submission and further submission. My submission sought application of the Rural Visitor Zone to the site, although my further submission supported the Cardrona Village Limited submission as an alternative to that. My evidence addresses technical matters relating to the proposed inclusion of former river bed in the SETZ. I do not stand to directly benefit from that outcome. Other than this interest disclosed above, I give my evidence in full accordance with the Code of Conduct.
5. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person.

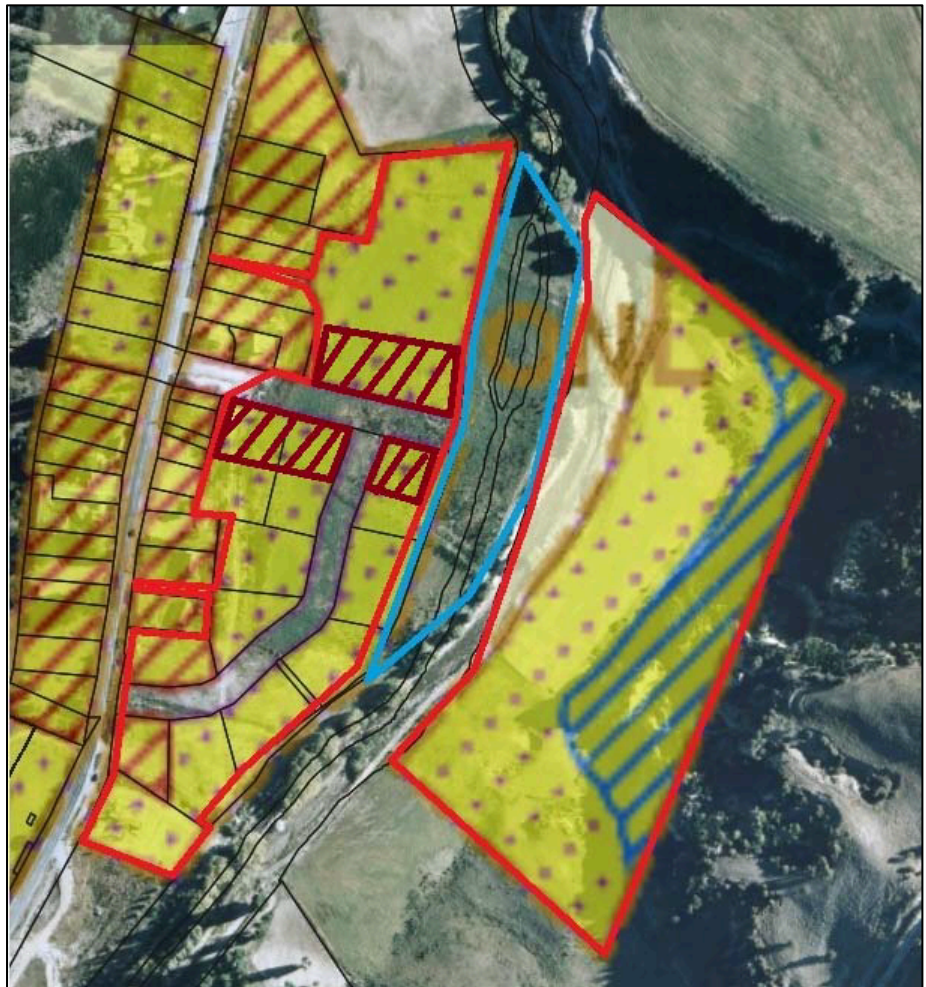
### **BACKGROUND INVOLVEMENT**

6. I have not previously been involved in the submission and further submissions made by Cardrona Village Limited ("**CVL**") in respect of this hearing topic, #3404, #31019, and Further Submission #31066.
7. However, I have provided advice to CVL in respect of its current consent application for the proposed development that comprises a mix of hotels, serviced apartments and terraced units, residential dwellings and hostels. Airey Consultants Ltd has also, under my direction prepared civil engineering assessments and plans for a number of development proposals and consent applications for the properties on either side of the Cardrona River, in this locality. These developments have included:
  - (a) The approved and completed 17 Lot subdivision on the western side of Cardrona River, on the southern side of Soho Street (RM050163).

- (b) The approved Land Use Consent Application for 49 residential/visitor accommodation dwellings and a lodge on the eastern side of the Cardrona River (RM061204).
- (c) The approved subdivision consent for a 28 Lot development on the western side of the Cardrona River, on the northern side of Soho Street (since lapsed, RM071177).

### SCOPE OF EVIDENCE

- 8. I have read the following, in addition to the CVL submission:
  - (a) the s42A report of Ms Devlin, Group 2(a);
  - (b) the evidence of Mr Bond (geotechnical and flooding matters);
  - (c) the evidence of Mr Powell (infrastructure matters).
- 9. I address in my evidence, in particular, that there is no flood risk, servicing, or other engineering reason not to rezone the “CVL land” subject to a land swap with the Crown (ie to be transferred to CVL) from Rural Zone (as former river bed) to SETZ.
- 10. I understand what CVL seeks is the rezoning of the “light blue land” in the following diagram to SETZ:



[The “**light blue land**” is sought to be rezoned to SETZ]

11. Ms Devlin identifies at [14.7] that the rezoning of the “light blue land” could yield seven residential lots, beyond the PDP enabled development capacity. She then states:
- (a) at [14.10] that the rezoning to SETZ is opposed from a geotechnical/flood risk perspective; and
  - (b) at [4.12] that the rezoning to SETZ is opposed due to a lack of sufficient information to demonstrate that the additional seven residential lots “can be serviced”.

12. I address these geotechnical/flood risk and servicing issues below.

**Geotechnical/flood risk**

13. Mr Bond states at [6.7]:

The key natural hazards affecting this site are considered to be 1) Liquefaction and 2) Flood Risk with minor hazards identified as 3) Unstable ground - Mining or Mine Wastes (tailings or subsidence).

14. I agree that these are the potential hazards to this area.

15. Mr Bond then goes on to say at [6.14]:

Overall, I do not consider the potential risks associated with liquefaction or mine wastes to be sufficient to reject the proposed zone change

16. I also agree.

17. Mr Bond records concerns relating to flooding, as follows (at [6.15]-[6.19]):

The submitted information includes extracts from a flood risk assessment prepared by Airey Consultants. The inspected detail indicates that the Cardrona River would flood the subject site.

As part of my assessment of the site natural hazards I have viewed the available data presented on the QLDC GIS and Otago Regional Council Natural Hazards database. I have also considered the topography of the Cardrona river and valley including the flood plain and information pertaining to the channel forms and erosion as well as rainfall data provided by NIWA.

On the basis of my assessment it is evident that the subject site is potentially at MEDIUM – HIGH risk from flooding. Published flood zone maps indicate the site is at risk from a 1:100yr (channel contained), 1:200yr and 1:500yr flood event.

It is therefore my opinion that in order to facilitate future development substantial flood mitigation works would be required. In addition, the construction of mitigation measures (such as bunding, channeling or filling of land areas) would most likely impact on the existing river floodplain and river channel by necessarily narrowing and channelizing the river, possibly causing adverse effects on adjoining properties.

I am of the opinion that there is insufficient information provided with the submission to enable an adequate assessment of the risks posed to be made in relation to natural hazard risks for the site. On this basis, I oppose the rezoning request from a geotechnical/flood risk perspective.

18. I do not agree that the rezoning request should be opposed from a geotechnical/flood risk perspective. My reasons follow.
19. The most recent flood risk assessment prepared by Airey Consultants indicates that the current flood model would result in flooding across the southern section of the "light blue land" that is proposed to be re-zoned and also a small area at the most northern extent of this land.
20. A copy of that flood map is in the following diagram.

Airey Consultants Flood Map Assessment for CVL (2019)



21. This flood risk assessment has been prepared as part of the current consent application for the proposed development on the western side of the river as described in Section 7 of this evidence. This assessment replaces earlier assessments that Airey Consultants have completed since 2006 which have all previously determined that the 100 year (1%AEP) flood levels are all contained within the embankments of the Cardrona River channel, and these assessments have been relied upon by QLDC for all previous consents. These previous assessments have also

correlated well with the November 1999 flood event which produced the highest flood levels in the catchment since the largest ever recorded event in 1878.

The 1999 flood event was assessed as being larger than a 150 year return event. Anecdotal and photographic advice provided of the November 1999 rainfall event confirmed that the river was contained within the embankment of the river channel, along the full length of CVL's property.

22. This most recent flood risk assessment by Airey Consultants now also allows for climate change which has increased the future predicted flows by up to 26%. This latest flood assessment predicts that for a future 100 year (1%AEP) event that some flood water may pond in the lower lying areas on the western side of the river as shown on the flood map above to previously. The depths of these "ponding areas" are generally very shallow with a maximum depth of 0.5m and an average depth of 0.25m.
23. These "ponding areas" do not contribute to the flow within the river, but are lower lying areas that the model predicts are to be overtopped in larger flood events. The storage volumes that are provided in these "ponding areas" are insignificant in relation to the flow that is occurring within the adjacent river. For example, the area within the southern section is approximately 2000m<sup>2</sup> with an average depth of 0.25m providing a storage of 500m<sup>3</sup>. The river has a calculated flow in a 100 year (1%AEP) event of 87m<sup>3</sup>/s such that this volume would flow through the river within only a 6 second period.
24. The future development of the "ponding area" and also all of the remaining land within the "light blue area", would require fill up to 1.0m depth to provide elevated flood free building platforms with a minimum freeboard of 0.5m above the 100 year (1%AEP) event flood level as required by QLDC's District Plan.
25. The loss of this very small flood storage volume within the lower lying "ponding areas" will have an insignificant effect on the flood levels within the river and would cause no measurable impact on the flood level of adjacent or upstream and downstream properties. All existing consented and proposed development on both sides of the river, including the "light blue area" proposed for re-zoning, would have flood free building platforms with the required level of freeboard above the 100 year (1%AEP) event.
26. The fill within the "light blue area" replicates the fill that has already previously been placed on the adjacent titles, Lots 7-10 DP440230, as part of that completed development under Consent RMO50163. This fill was also placed to provide the required freeboard for flood free building platforms.
27. I also note that this placement and compaction of this material, with some further treatment of the existing ground profile, will further reduce the low risk associated with liquefaction and mine tailings that have been identified by CVL's geotechnical engineers KGA Geotechnical Ltd, and also by Mr Bond. KGA's Geotechnical Engineering Assessment Report 190164-1 dated 7 June 2019, and supporting information within their Section 92 Response dated 6 April 2020, confirms that due to the soils comprising coarse grains and boulders with less than 50% sands, that liquefaction is unlikely in these types of soil, and even less risk will occur with suitable foundation and/or the recommended ground improvements.

28. KGA's report recommends that shallow ground improvement of the mining tailings that exist across the full site be undertaken to remove any risk of settlement of these materials and/or that foundations are provided to found on the underlying strong natural ground and I support this opinion as also being appropriate for the soils within the identified "light blue area" proposed for re-zoning.
29. Armouring of the toe of the proposed fill and the embankment slope either by utilising the site won boulders already located on the site, and to be supplemented by excavation on the adjacent land, or by the use of geogrid reinforcement, would be included with the Resource Consent Application required to complete these works, at that time.
30. On the basis of the above, I conclude that there are flood mitigation options available at the time of the development of the "light blue area" to provide for flood-free, stable building platforms for those activities enabled by the SETZ, and that any required flood mitigation works will not:
- (a) Accelerate or worsen the natural hazard and/or its potential impacts.
  - (b) Expose vulnerable activities to intolerable natural hazard risk.
  - (c) Create an unacceptable risk to human life.
  - (d) Increase the natural hazard risk to other properties.
  - (e) Require additional works and costs that would be borne by the community.

### **Servicing**

31. Mr Powell stated the following at [11.2]-[11.5]:

**Water supply:** infrastructure within Cardrona is made up of a number of private schemes. Evidence of consent to connect and consented volume take from the private water schemes will be required from the systems owner and be provided by the submitter prior to a rezoning occurring.

**Wastewater:** treatment within Cardrona is at limited capacity. Modelling of the reticulation and treatment plant would be required to confirm capacity. QLDC has entered into an agreement (Development Agreement) with a developer to work together towards the development of a new wastewater treatment plant to service Cardrona valley including the village. The agreement is conditional and the details are being worked through.

**Storm water:** There is no storm water infrastructure in the vicinity of the subject site, as with neighbouring developments onsite storm water disposal is considered to be feasible and appropriate.

From an infrastructure perspective I oppose the proposed submission until such time that sufficient information has been provided by the submitter, demonstrating that an additional 7 lots can be serviced by private networks, Council infrastructure or a combination of both.

32. I reply as follows.

### **Water Supply**

33. The owners of CVL also own Cardrona Water Supply Ltd which is the privately owned system that provides reticulated water to most of the residences, and also to the hotel in the Cardrona township. This water supply network system and the water-take consent for this supply has capacity for a demand of 500 m<sup>3</sup>/day and easily has sufficient capacity for the additional development of this area.

### **Wastewater**

34. The provision of a suitable public or community wastewater reticulation and treatment system is required to enable Cardrona Village to be developed in accordance with the proposed SETZ provisions. The additional capacity required for the development of this relatively small area of additional land in relation to the scale of the system to serve Cardrona village, and possibly also for the consented Mt Cardrona development and the Cardrona Alpine Resort, is insignificant in relation to the overall requirements of this scheme.
35. I do not consider that the re-zoning of this area will provide any constraint to the design of the future wastewater treatment system.

### **Stormwater**

36. Stormwater from all consented and current applications on the adjacent land has been designed to discharge into the Cardrona River. The existing developed lots on Soho Street and Rivergold Way currently discharge to the river via rock-lined swales.
37. Appropriate infrastructure, to enable stormwater from the development of this land to discharge into the Cardrona River, can be provided at the subdivision/development stage to comply with QLDC's Land Development and Subdivision Code of Practice requirements.

### **Conclusions**

38. In my opinion, the "light blue area" proposed for re-zoning can be suitably developed to provide flood-free, stable building platforms that can be appropriately serviced with infrastructure in a similar manner to that which will be required to be provided to enable the servicing of the proposed SETZ on both sides of the Cardrona River.

**Michael Lee**  
**29 May 2020**



**ATTACHMENT A:**

CV and Statement of Michael Lee's relevant experience

## **Airey Consultants Ltd**

### **Work History and Key Projects**

#### **Role at Airey Consultants Ltd**

Director and Engineer

#### **WORK HISTORY**

##### **Airey Consultants Ltd**

Dates: 1990 to present

Position: Director and Engineer

Responsibilities: A director since 1998. Management of a range of clients and projects from Airey's Takapuna office. Oversees all aspects of project management and civil engineering design of land development projects (with a strong emphasis on planning, consultation and liaison). Undertakes projects for local authorities involving all aspects of public works infrastructure including commercial street works rehabilitation, catchment analysis and pumping stations upgrades. An expert witness to prepare and present evidence at council hearings and the Environment Court.

#### **Qualifications**

- Bachelor of Civil Engineering, University of Auckland, 1988
- Chartered Professional Engineer (Civil) (since 1994 previously Registered Engineer)
- Diploma in Highway Engineering, 2003

#### **Affiliations**

- Member of Engineering New Zealand (Institution of Engineering Professionals New Zealand)
- Member of ACE New Zealand (Association of Consulting Engineers New Zealand)

#### **Key Projects**

Civil Engineer to the following projects:

- Bayswater Marina (2020) – A mixed use development of a prominent Marina on Auckland's harbour front
- Ara Hills Development (2018 – present) – A master planned development of 700-900 houses at Orewa
- Pinecrest Subdivision – A 137 lot development at Gulf Harbour
- Ridge Road Cleanfill – A ten million cubic metre Cleanfill within an operating quarry at Bombay Hill
- Blackbridge Road Cleanfill – A one million cubic metre Cleanfill operation approved by the Environment Court in Dairy Flat
- Thornton Subdivision – An 89 lot subdivision at Upper Harbour Drive, Greenhithe
- Orewa West Investments Ltd (2015) - A 600 lot development at Orewa with significant earthworks, wastewater, water supply and stormwater management requirements



- Fairview Avenue (2015) - An 89 unit integrated housing development in 14 terrace housing clusters and 2 apartment blocks in Albany
- Snells Beach (2015) - A plan change for an 81 lot subdivision at Dawson Road, Snells Beach
- Hamurana Avenue (2015) - An 18 lot subdivision at Te Atatu Peninsula
- Greenhithe Subdivision (2012 – 2015) - Various subdivisions in the Greenhithe area including:
  - An 89 lot subdivision for Kyle RL Ltd and developed by Fletcher Residential Ltd
  - A 35 lot subdivision at Blacks Rd, Greenhithe
  - A 14 lot subdivision at Bernard Magnus Lane
  - A 16 lot subdivision at 140 Greenhithe Road
  - A 25 lot subdivision at Huntington Park Drive
- G J Gardner Ltd (2013 – 2015) - Long Bay Subdivisions:
  - 6 lot development at Lots 1-6 Caldera Drive
  - 6 lot development at Lot 174 Caldera Drive
  - 6 lot development at Headland Drive
- Milford housing and apartment development, Dodson Avenue
- Hobsonville Point infill subdivisions
- Hobsonville Point (HLC and AV Jennings Ltd) (2012 – 2013)
  - A 22 lot subdivision at Waiarohia Place (BA22)
  - Reconstruction of Buckley Avenue
  - Superlot VI, stages 3, 5, 6
  - Hobsonville Point Pumping Station
- Assessment review for shared street projects (Elliott St, Lorne Ave, Fort St) for Auckland Council to ensure critical deliveries for World Cup were met for major street upgrades.
- Development of new village, Cardrona, (2006 - present)
- Glendhu Road 40-lot subdivision, Albany (2010) - including new road construction, widening existing roading network, significant timber pole retaining wall construction and stormwater management
- Remarkables Park Development, Queenstown (2000's – present)
- Vista Verano 90-lot subdivision, Development, Mangawhai (2009)
- Okura Waterside Development (2009)
- Gateway to Queensland Homes, 3 subdivisions at Gulf Harbour, (2008)
- Royal New Zealand Navy HMNZS Philomel Roding Reconstruction
- First Capital Gulf Harbour Development (2008)
- Seabreeze Estate, Whangamata (2007)
- Otahu Subdivision, Whangamata (2007)
- Mairangi Bay Main Street Upgrade, North Shore (2002)
- Pauanui Waterways (2000's)
- Maygrove Subdivision (1990's)

