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Auckland Council
135 Albert Street, Auckland
AUCKLAND 1010

Att: Emma Chandler

King Quarry Expansion, Stage 2, Pebble Brook Road, Wainui, BUN60450001
Traffic engineering peer review and design audit

Dear Emma

1 Introduction

Shumane Consultancy - 2015 (***SCON***) has been engaged by Council to evaluate the likely traffic engineering effects of the Stage 2 expansion of Kings Quarry at Pebble Brook Road, Wainui, (**the Site**). Council's reference is BUN60450001. The proposal is processed as a fast-track project with the reference number FTAA-2502-1018.

We completed our traffic evaluation following our site visit and field audit on 17 June 2025, which we conducted with a representative from Auckland Transport (**AT**). During our site visit, we observed the upgrade works of the road that was then underway, examined a few locations where there may be concerns, specifically at the intersection with Waitoki Road, the one-way bridge on Pebble Brooke Road (about 250 m from the intersection) and the culvert under Pebble Brooke Road immediately east of the Site's access.

For the purposes of our evaluation, we have reviewed the following documents:

- Traffic Assessment Report (**TAR**), prepared by Commute Transportation Consultants (**Commute**), dated 31 March 2025.
- Auckland Transport's (**AT**) memo for the proposal, dated 27 June 2025.
- Engineering Plan Approval (**EPA**), ENG60418714, for upgrade works required by Stage 1 consent, the EPA is dated 08 December 2023.
- Assessment of Environmental Effects (**AEE**), prepared by Barker and Associates and dated 24 April 2025.

Where relevant, our evaluation takes into account the relevant requirements of the Auckland Unitary Plan – Operative in part (**AUP-Oip**).

Our expertise is of the traffic safety and effects of the proposal only; this said, where we identified issues with the upgrade works, we referred these to AT to consider. Moreover, while we provided assistance to AT regarding the existing Waitoki Road intersection, we did not wish to comment on the effects as these are covered in AT's memo.

2 Summary Conclusions

Having reviewed all available information, our overall conclusions are as follows:

1. The heavy vehicle composition is expected to increase from 16% (current) to 26% (with Stage 1) to 38% (with Stage 2). While the actual volumes are quite low, the heavy composition is much higher than would be expected from a similar road.

2. Our field observations and desktop analysis did not show any particular location where sightlines at private accesses are inadequate. The crash analysis completed by Commute indicates that there are no current safety issues with private accesses.

3. Although the heavy vehicle composition is much higher than a similar road, as long as the sightlines are adequate, and they are, then safety at the existing crossings is unlikely to be compromised.

4. There will certainly be an increase in the occurrences where local drivers have to wait for a truck to pass through, but this does not necessarily mean an alarming increase in risk of collision.

5. From observations and review of the EPA plans two issues have been identified that may require addressing, 1) the design of vehicle crossings of Nos 58-68, and 2) the gravel used for surfacing the road.

6. Along the section of road immediately east of the Site's access it is our recommendation that a W-Section barrier be installed along the northern edge of the carriageway to provide a safer environment to the occasional pedestrian as well as truck drivers turning left out of the site.

Overall, the proposed expansion can be supported, from a traffic engineering perspective, on the condition that the recommendations of this review are considered.

3 Traffic Engineering Effects

3.1 Heavy Vehicle Traffic Volumes

Table 1 of the TAR includes the traffic movements at the Waitoki Road / Pebble Brook Road intersection as surveyed on 17 October 2023. We understand that the surveys were conducted priori to Stage 1 becoming operative.

The information of Table 1 indicates that during the peak hours there were only 8 and 4 heavy vehicle movements (in both directions) during the AM and PM peak hours respectively.

Paragraph 4.1 of the TAR states that the Stage 1 consent allowed for a maximum of 100 daily truck movements and 10 peak hour movements. The TAR does not quantify if these represent the truck numbers, i.e. 100 trucks daily resulting in 200 truck movements, or just movements. The wording of Paragraph 4.1 implies that the maximum permitted is 50 trucks daily (100 movements in both directions) and 5 trucks during the peak hour (10 movements in both directions).

The reason it is important to be clear about the quantum used (trucks or movements) is because the current volumes are quite low and even minor increases would be felt or perceived as quite high. For example, the October 2023 surveys show that the peak hour truck volumes were 8 and 4 truck movements, with Stage 1 becoming operational these will increase by 60% and 125% during the AM and PM peak periods. While the volumes are indeed low, the perceived effects are not necessarily proportional in our view.

The other reason clarity about the numbers is important is because it is required for the pavement design, which is a matter for AT's specialists to comment on it and is indeed discussed in AT's memo.

Paragraph 4.2 of the TAR provides a trip generation analysis of the Stage 2 operation. Interestingly, Paragraph 4.2 clarifies the difference between trucks and truck movements, which is appropriate. The TAR concludes that Stage 2 operation will generate up to 90 daily trucks (180 truck movements), and approximately 8 trucks (16 truck movements) during the peak hours.

Although it is not clearly stated in the TAR, but we understand that the truck movements of Stages 1 and 2 do not overlap, i.e. while Stage 1 is in operation the additional peak hour truck volume is 5 trucks (10 movements in both directions), and which will increase to 8 trucks (16 movements in both peaks) once Stage 2 becomes operational.

As noted above, these volumes are not significant but should be put in the correct context.

From GIS, Pebble Brook Road is appropriately 2.8 km long (1.9 km between Waitoki Road and the Site), and it provides access to approximately 45-50 properties. The survey results provided in the TAR indicate that car volumes are about 31-32 vehicle movements (in two directions) during the peak hours, which are quite low for a rural area with 45-50 properties that usually generate about 1.2 vehicle movements during the peak hours.

Notwithstanding the above and while indeed some of the truck movements along Pebble Brook Road are not necessarily generated by Kings Quarry, the following is the traffic environment (values below are peak hour averages):

- Current: 36-39 vehicle movements including 6 truck movements on average (16% heavies).
- With Stage 1: 41-44 vehicle movements including 11 truck movements on average (26% heavies).
- With Stage 2: 49-52 vehicle movements including 19 truck movements on average (38% heavies).

The above values do not include the potential for intensification in any of the properties along Pebble Brook Road.

3.2 Effects of Heavy Vehicle Traffic

We do not have data (from AT or any other source) about the typical average of heavy vehicle composition on rural roads, but on typical urban collector and arterial roads, the composition is usually 6% to 8%. Therefore, the ultimately almost 40% heavy vehicle composition on Pebble Brook Road is much higher than would be expected from a typical road and this is understandable given the Quarry operation.

However, the effects of this high percentage must be considered.

Below is our assessment of the effects on accesses of the 45-50 properties that gain access from the same road.

Our observations of the existing accesses did not show any location where visibility may be compromised or restricted to the point where access would be unsafe.

NZTA's '*Guidelines for visibility at driveways*', or RTS 6, recommends a minimum sightline of 30 m to 40 m for the local environment (low volume with a 40 kph to 50 kph speed environment). Our desktop analysis, which was based on our field work, did not identify any crossing with sightlines less than those recommended.

The crash analysis discussed in Paragraph 2.5 of the TAR explains that the three recorded crashes along Pebble Brook Road did not involve a vehicle crossing manoeuvre. This, in our opinion, is an indication that indeed sightlines at all crossings are acceptable as we also have determined by our desktop analysis.

Regardless of whether the heavy vehicle composition is 10% or 50%, as long as sightlines are adequate (and in most cases they exceed the recommendations) then safety at the private accesses is unlikely to be compromised. We therefore have no concerns in this regard.

Certainly, drivers accessing private properties will experience more occurrences where they may need to wait to allow a truck to pass through before they can turn in or out their property, but this can still occur safely. In our view the increase in risk of collision is unlikely to be alarming to the point where substantial improvements are required.

We are not qualified to comment on the matter of amenity (or dust and noise).

3.3 General EPA Observations

Currently, upgrade works are underway along Pebble Brook Road between the Site and the one-lane bridge. We have examined the approved EPA plans following our site visit and make the following comments

1. The EPA drawings show some upgrades to all private accesses, such as installing culverts where none are currently present and replacing old culverts.

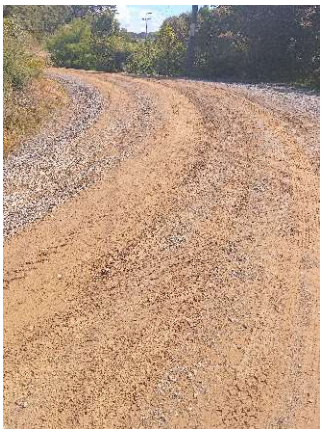
2. While a localised widening is to be completed along the bend at Chainages 300 to 350 to accommodate for comfortable and safe passing of two trucks, it would seem that the design did not fully take into account the impact on two vehicle accesses that serve several properties (Nos 58 to 68).

3. The upgraded pavement of the currently approved design (Sheet RD-212) does not extend beyond the widened area where standard practices require the crossings to be reconstructed while adjusting the gradients. The gradients of the existing crossing serving Nos 60 to 68 is not too critical, but following widening, i.e. extending the carriageway towards the property boundary, the crossing might become steeper. We do not have sufficient information to calculate the gradient post upgrade.

4. It is noted that at least the crossing of Nos 60 to 68 is not to current standards in that it does not intersect with the carriageway at a right angle. Again, typically, these aspects are corrected during any upgrade works. It may not need to be perfectly perpendicular to the carriageway, but a realignment is necessary in our view to provide better for residents.

5. The typical cross section of the road (Sheet RD-239) shows the type of seal that is used. Of course, assessing the design of pavement is a matter for AT's specialists to undertake, but the gravel used (meant to be GAP 40) did not appear to be of good quality during our site visit. This is only based on observations, we have not completed any tests, and we have not been requested by Council to complete any tests. This said, we highlighted the matter to AT to consider.

6. In our experience, using inappropriate surface gravel could lead to a slippery surface in wet conditions and dust nuisance in dry weather. Moreover, also from experience in the field of road construction, the inappropriate type of gravel could very easily wash away in even moderate rainstorms. The illustration below shows the inappropriate type of gravel mentioned above (not Pebble Brook Road).



The above are observations of the current works, which we understand are required by Stage 1 consent, but there are issues, perhaps measures can be required as part of the Stage 2 consent, such as addressing the issue of design of the crossings of Nos 58 to 68 and looking into the surface gravel.

3.4 Road Safety at Chainage 1570

The Stage 1 upgrades include extending the existing culvert at Chainage 1570 and installing a new wingwall; these works have been completed as observed during our site. The EPA plans do not show the inclusion of a barrier similar to that located along the southern side of Pebble Brook Road at Chainages 600 to 690 (for the retaining wall).

Our observations show that as trucks turn left out of the Site, they come very close to the edge of the newly established carriageway, which narrows down to about 7.0 m at the culvert.

Pedestrian volumes are very minimal (we did not observe any during our site visit), but perhaps not nil. If a pedestrian (a local resident walking a dog) happened to be at this location when a truck is turning left out of the Site, they would be in a very vulnerable position wedged between a truck and a steep bank. This is a very unlikely scenario, but not necessarily unfathomable given the increase of truck movements as part of Stage 2 expansion.

We strongly recommend that a W-Section barrier be installed on the northern edge of Pebble Brook Road carriageway along the culvert to provide the minimal protection needed not only for the occasional pedestrian but also truck drivers. A W-Section barrier will define the extent of seal available to truck drivers and the means for a pedestrian not to fall down the steep bank.

While a similar barrier may be beneficial on the southern edge (similar steep bank), trucks would not need to come too close to the edge when they turn into the Site and therefore the risk of falling is much less. This said, it would be beneficial to install.

4 Auckland Transport's Comments

We have reviewed the comments made by AT and we generally agree with their concerns regarding the lack of sufficient details to assess the safety effects at the Waitaki Road intersection. Based on the traffic surveys Whitehills Road seems to be the most convenient route to truck drivers to and from the motorway and arterial network and as this intersection is not a full cross-junction, the staggered arrangement of its side roads makes more complex by increasing its conflict points.

We also fully agree with AT regarding the issue of pavement noting that we identified the gravel used for surfacing may need to be tested.

5 Conclusions and Recommendations

Overall, having considered the likely traffic related effects that may be generated by the expansion of Stage 2 it is our overall conclusion that the proposal can be supported on traffic engineering grounds on the condition that the following be considered:

1. All requests by AT be responded to in particular the aspect of pavement of design including the quality of surface gravel used.
2. The design of the road widening at Chainages 300 to 350 be reassessed to take into account the safe operation of the vehicle crossings of Nos 58 to 68.
3. A W-Section barrier, or similar, be installed on the northern side of Pebble Brook Road along the culvert at Chainage 1570.

We trust the above report is satisfactory for your purposes.

Kind regards

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