



27 January 2021



Adele Dawson  
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By email

Dear Adele

### **TAGGART EARTHMOVING LTD APPLICATIONS - RESPONSE TO S 92 REQUESTS**

Thank you for your 22 December 2020 requests for further information for resource consent applications CRC204106, CRC204107, CRC204143 and CRC211629 (made to Environment Canterbury) RC205105 (made to Waimakariri District Council).

The attachments to this letter set out Taggart Earthmoving Ltd's response to those requests. These are:

- ✧ Attachment 1: Response to questions from Waimakariri District Council (a tabulated written response);
- ✧ Attachment 2: Response to questions from Environment Canterbury (a tabulated written response);
- ✧ Attachment 3: Floor level survey results (results from work PDP undertook to respond to questions regarding the effect of flooding);
- ✧ Attachment 4: Flood modelling results with breached western bund (two figures showing analysis of Q100 flooding events with an excavated gap in the western bund to mitigate flood water diversion to the west of the site);
- ✧ Attachment 5: Amended suggested consent conditions (with alterations shown in tracked changes in response to the section 92 questions and making other minor corrections and improvements).

This is Taggart's full response to the section 92 requests.

Currently a site visit is planned for 17 February 2021. Given this Taggart would appreciate a revised program for the completion of the application process through to a hearing.



Please refer any further enquiries or correspondence to Mike Durand or Hamish Peacock.

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Yours faithfully

**PATTLE DELAMORE PARTNERS LIMITED**

Prepared by



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Reviewed and approved by



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## Attachment 1

### Response to questions from Waimakariri District Council

Question / comment	Response
<b>Vehicle movements/Traffic</b>	
<p><b>1. The Abley Traffic Assessment assumes an hourly traffic generation rate of 32vph however this is based on the activity generating a maximum of 240vpd split evenly over a 7.5hr working day.</b></p> <p>The site could potentially generate a higher number of traffic movements some hours and a low number for other hours.</p> <p>What is the maximum number of movements the site could generate per hour and what is the anticipated impact of a higher hourly traffic volume on the road network (particularly during the PM commuter peak)?</p>	<p>Table 5.1 of the Abley Traffic Assessment (Appendix F) should be referenced along with the traffic generation. This table shows the maximum number of movements per hour, with an additional 32 movements per hour (one movement per 1min 53 seconds) from the Taggart site measured at points 2, 3, 4 or 5. This is a worst-case scenario for traffic movements. The Abley Traffic Assessment also assesses the safety, efficiency and capacity on the network, recognizing that Taggart can manage the extraction and backfilling traffic independently, so not needing to assess the combined/simultaneous traffic effects.</p>
<p><b>2. The Abley Traffic Assessment notes that as the accessway from River Road will not allow for simultaneous heavy vehicle entry and egress movements to occur, a site management plan and operational controls will be required. It is not clear however, how it is intended to manage traffic movements of vehicles not owned or operated by Taggart to ensure there is no queuing on River Road.</b></p>	<p>All trucks will be required to have Radio Transmission (RT) communications between arriving and departing (to and from the site) drivers, and the site operations manager. This already occurs at the Cones Road site with a sign specifying the channel that needs to be used. This current system avoids queuing as the radio communication can reach between the Racecourse site and the Cones Road site.</p> <p>Further, there is full visibility to and from the site's River Road entry/exit in both directions along River Road, so drivers waiting to depart or arriving will be able to confirm the traffic situation visually before manoeuvring onto or off the site (as a check following RT communications).</p>
<p><b>Please provide further details of the management approach or operational controls that will be utilised to ensure that all vehicles</b></p>	<p>The majority of movements will be Taggart's, and only occasionally would other operators access the site. There will be no access to the site by other operators without prior arrangement with Taggart.</p>

entering and exiting the site are managed to avoid the queuing of heavy vehicles on River Road.	
<b>3. It is proposed to import VENM onto the site for backfilling purposes. Will a particular route to the site be used when transporting VENM? If so, please provide details of the roads to be used around the site.</b>	Lehmans Rd and River Road is the recognized heavy traffic route for this part of Rangiora. Depending on where VENM comes from, this will generally be the route taken. If the most direct route is through Rangiora from the south of Oxford Road to the site, Taggart can still avoid West Belt and utilize Lehmans Road and River Road. All traffic will use the access to and from River Road, as described in the proposal.
Lighting	
<b>4. Is it proposed to use any artificial lighting during the quarry activity? If so, please provide details of the type of lighting proposed, where it will be located and an assessment against the Waimakariri District Plan rules.</b>	There will be no artificial lighting, apart from vehicle lights.
Flooding	
<b>5. The revised application has included an assessment of the potential effects of diverting floodwaters as a result of the construction of acoustic bunds. Flood modelling outputs are provided which demonstrate the predicted increase in flood depth in the 1%, 0.5% and 0.2% Annual Exceedance Probability Flood Events. The revised information shows there is no longer any predicted effects on any consented residential subdivision areas, however potential effects are shown in rural and rural-residential areas. Policy 8.2.1.3 of the Waimakariri District Plan seeks to avoid floodwaters entering residential, commercial and industrial buildings and Policy 8.2.1.4 seeks to avoid, remedy, or mitigate the</b>	<p>The table in Attachment 3 of this document provides the estimated floor levels, and the average LIDAR at the measured floor level area. This average is because LIDAR varies across each dwelling floorplate.</p> <p>The campground (337 Lehmans Rd) along with 359, 373 and 379 Lehmans Road will all be subject to flooding above the floor levels in certain flood events. For some properties this is the existing situation, and for others only following the construction of the bunds.</p> <p>The following is noted about those who have made submissions from Council's "affected" list:</p> <ul style="list-style-type: none"> <li>• Stewart Gilbert &amp; Phillipa Watkins - 331 West Belt, submission in opposition (&amp; be heard); and did not raise flooding issues</li> <li>• Ian J Powell - 359 Lehmans Road, submission in opposition (&amp; not be heard); and did not raise flooding issues</li> <li>• Karen Calder- 337 Lehmans Road, submission in opposition (&amp; not be heard); and did not raise flooding issues.</li> </ul>

adverse effects of activities that impede or redirect the movement of floodwater on a site, and/or exacerbate flood risk.

The habitable dwellings and other buildings in the rural/rural-residential areas that could be affected include:

- 109 River Road
- 336 West Belt
- 335 West Belt
- 331 West Belt
- 311 West Belt
- 359 Lehmans Road
- 373 Lehmans Road
- 337 Lehmans Road
- 379 Lehmans Road

In order to understand the implications of the modelling result and assess the proposal against the policies of the Waimakariri District Plan, please provide a site specific assessment of each habitable dwelling and ancillary building where flooding is shown as increasing and demonstrate that the reduction in freeboard is acceptable at each property.

Alternatively, you could provide written approval from these landowners and occupiers (where relevant).

6. The application has provided an assessment of the potential increases in the depth of flooding as a result of different magnitude flood events however, it is not clear if the

- Other properties owners/occupiers from Council's list do not appear to have made submissions.

For completeness PDP have (where possible) obtained floor levels and assessed flood effects, as shown in the table in Attachment 3. As 331 West Belt, 359 Lehmans Road and 337 Lehmans Road have made submissions it is not expected that they will provide written approval.

As the intensification of flooding on some properties (and attenuation on others) is a secondary effect of the acoustic bunds there needs to be consideration of the risk profile of flooding those properties above flood levels (of the residential dwelling).

Additionally of note, flood modelling shows that the River Road and West Belt properties have a reduced flood water level in a Q500 event as a result of the bunds.

In the event of a flood warning or flood event, Taggart could undertake works to excavate a portion of the western bund, to allow flood waters through to alleviate flood effects on the Lehman Road properties. A new Condition 14 of the proposed conditions (Attachment 5) has been added to require this as follows:

- 14 If Environment Canterbury issues a flood warning for the Ashley River/Rakahuri of Q100 or greater, the Consent Holder shall immediately, at or about the location shown on Figure X:*
- a. excavate an opening of no less than 10 m width through the western bund;*
  - b. excavate a trench no less than 0.5 m in depth through the opening; and*
  - c. maintain the open excavations in the bund until the Ashley River/Rakahuri is no longer subject to a current flood warning from Environment Canterbury.*

PDP has undertaken flood flow modelling under this scenario to show the efficacy of this measure. Mapped results of that modelling are presented in Attachment 4.

The flood duration will be unaffected by the bunds, as the drainage of deflected flood waters will occur via the attenuation channel, or if Taggart were to cut a 10m gap in the bund before a flood, this would significantly reduce the extent and duration of flooding. Refer to the answer to question 5 as to the implications of flood mitigation.

**acoustic bund will have any effects on flood duration. Please provide an assessment of the potential effects on surrounding properties from any changes in flood duration.**

Flood duration is affected to a greater degree by the source of flood waters (i.e. Ashley River breakout) and extend of flood waters. The duration can also be impacted by the extent of the level of protection provided by the Ashley River stockbanks, and if any damage occurs to those stockbanks.

## Attachment 2

### Response to questions from Environment Canterbury

Question / comment	Response
<p><b>1. Managing 1m separation to groundwater during excavation</b></p> <p><b>The application describes that it is proposed to maintain at least 1m separation from the quarry pit floor and groundwater. To achieve this, the application and consent conditions describe proposed monitoring of groundwater levels to trigger backfilling of VENM if there is less than 1m separation to groundwater.</b></p> <p><b>Data from Environment Canterbury monitoring wells in the area (M35/17986 and M35/2679) suggests that groundwater levels can increase by more than 0.5 to 1m within 24 hours. It is not clear based on the maximum extraction area proposed, if there will be sufficient VENM available on site at all times to enable an immediate backfilling response as proposed.</b></p> <p><b>Please demonstrate how backfilling will occur in response to increased groundwater levels while operating within the other constraints proposed on the activity, for example limiting disturbed land to no greater than 2ha. The assessment should take into account the level of fluctuation of groundwater levels and how quickly they may rise and the available material from Stockpile B</b></p>	<p>Available backfill exists in the following forms:</p> <ul style="list-style-type: none"> <li>• Stockpiles A and B could potentially have up to 34,500m<sup>3</sup> of extracted material and VENM available used for backfilling, and if necessary,</li> <li>• Taggart could drag the pit walls down to reduce the pit depth further.</li> <li>• Taggart's yard at Cones Road stores further VENM materials that could be transported into the Racecourse site and deposited within the proposed operating hour and traffic limits.</li> </ul> <p>The following is an example of the volume of material required to respond to sudden rising of groundwater: If 2 hectares were open (the maximum extraction area proposed), and 1m of cover was needed, Taggart would require 20,000m<sup>3</sup>, which would be available on site in the stockpiled material. The time required to move 20,000m<sup>3</sup> material is 4-8 hours using the motor scraper and excavators.</p> <p>While the exposed surface could be 2ha, potentially the deepest part of the pit might only be 0.5ha (50mX100m), which a lot less material to backfill would be needed, and this could occur a lot more quickly.</p>

## 2. Backfilling with VENM

**The application describes that VENM will be used to backfill the excavated quarry pit and backfill material may be placed below the highest groundwater level. It is estimated that no more than 87,969 cubic metres of material will be required for each 2ha stage to allow for backfilling back to the original ground level. VENM will meet the WasteMINZ Class 5 criteria which the application acknowledges has a limited source. The backfilling of the excavation is fundamental to providing long-term protection of groundwater by increasing the separation to groundwater.**

**Prior to moving onto a subsequent stage, the application states that full rehabilitation may not occur depending on demand for aggregate.**

**Based on the proposed depth of excavation and excavation area, a large quantity of material is required for site rehabilitation. Given the importance of maintaining separation between ground level and highest groundwater level it is critical that at least 1m of separation is maintained. It is currently unclear if there will be sufficient material to provide this long-term protection and how the staging will be managed to ensure that rehabilitated stages (even if partially**

Taggart has confirmed their business has adequate available sources of VENM for this quarry and the rehabilitation. If they didn't have adequate access to VENM, Taggart would not propose this, as it would make the quarry unviable (limited to 2ha). Taggart are in the earthmoving business, that allows them to target VENM opportunities, which provides greater certainty that they have available sources, market supply, and incentives to utilize VENM as part of the backfilling of this quarry.

The staging is fairly simple in that no subsequent 2ha stage can proceed until the rehabilitation of the previous stage has occurred, however the final capping of a stage will see the "flipping" of overburden of the subsequent stage. That overburden is predicted to be approximately 600mm deep.

As outlined in the answer to question 1, a 2 ha stage may only see 0.5ha (50m X 100m) pit at any one time, limiting the extent of potential groundwater raising above the pit base.



<b>backfilled) will ensure that groundwater does not rise above the ground surface.</b>	
<b>(a) Please provide further information to demonstrate that sufficient, appropriate backfill material will be available for site rehabilitation.</b>	The VENM generally will come from excess overburden of subdivision developments, commercial and residential excavations and rural developments such as water storage ponds and access track excavations in the local area. Currently this material is disposed of outside the WDC area and comes at a cost to the infrastructure network and the environment due to additional travel distance that is required for disposal. Taggart has generally not been accessing large quantities of this material, in the manner required to rehabilitate the quarry, as they have no current use for such volumes of VENM. While Taggart have avoided VENM, historically Taggart has disposed of up to 30,000m <sup>3</sup> from excavations carried out by Taggart Earthmoving Ltd. The supply of material is determined by the availability of material, and Taggart expects this volume to increase in the near future due to the current demand for subdivision developments in the district.
<b>(b) Please provide further details regarding how staging will be managed if backfilling does not occur back to the original ground level prior to moving onto a subsequent stage, for example, is it proposed to backfill to a minimum level within each stage?</b>	It is proposed to backfill to existing ground levels for every 2ha, and only the flipping of topsoil would occur between stages. To this end while a pit may only open 0.5ha, the maximum “pit” at any one time would be 2ha.
<b>3. Hazardous Substances and Refuelling</b>	
<b>The application states that no routine maintenance of machinery will occur on site, refuelling will occur outside of the extraction pit through the use of a mobile tanker and a spill kit will be maintained on site. Additionally, there is some conflicting information between the proposed conditions and the application and draft quarry and backfill management plan regarding the storage of hazardous substances on site.</b>	<p>No hazardous substances will be stored permanently on site. The AEE and QBMP states that generally refuelling and lubrication of trucks and machinery will be carried out offsite. However, there will be a need for some refueling and lubrication on site.</p> <p>Hazardous substances will be brought on site and used on the plant and equipment (fuels and oils). Any refueling occurring will be from a mobile tanker, outside the open pit. Mobile tankers have their own spill kits.</p> <p>Refueling will occur no closer than 20m to the pit face (outside the pit).</p> <p>A hydrocarbon spill is assessed in Section 3.2.2. of the AEE.</p>

Please confirm:

- If any hazardous substances will be stored on site and if so, the quantity and type of hazardous substances to be stored on site
- If any hazardous substances are stored and used onsite, what measures or controls will be used to protect exposed surfaces from potential spills or leaks such as storage on sealed surfaces or within buildings.
- The location outside of the excavation pit where refuelling will occur;
- Methods that will be used when refuelling to avoid spills and manage spills in the event leaks occur.

#### 4. Water demand from quarrying

**The air quality assessment appended to the application as Appendix D provides an assessment of the water demand for dust suppression to confirm there is sufficient water available for use authorised by the existing resource consent CRC160231. The assessment refers to the multiple onsite uses for dust suppression over the quarry area, racetrack and access road but does not consider any other onsite water use.**

**CRC160231 authorises the use of water for dust suppression and irrigation. The assessment of available water under CRC160231 does not consider the demand for irrigation by the racecourse or any water**

Based on reviewing 5 years of meteorological data from Christchurch Airport to determine water demand based on peak evaporation rate, with the maximum unconsolidated area of 4.65 ha, the site would require maximum of 49,141 m<sup>3</sup> of water annually and a maximum of 2,325 m<sup>3</sup> of water over 7 consecutive days.

PDP has also reviewed water consumption data (September, October, and December 2020) provided by Rangiora Racecourse. This data provided total water usage for their operations and did not specify between water used for irrigation or track watering. Based on the maximum daily use during this period, the maximum calculated annual water consumption would be approximately 22,000 m<sup>3</sup> and the maximum 7 consecutive day usage would be approximately 450 m<sup>3</sup>.

When you add the maximum water usage for the Racecourse, and the maximum predicted water usage for the proposed quarry, the total water usage would be 71,141 m<sup>3</sup> annually and a maximum of 2,775 m<sup>3</sup> of water over 7 consecutive days, which is well below the consented limited. Given that all these numbers are based on maximum values, the predicted water usage for the site is very conservative. This provides confidence that sufficient water is available for the Racecourse uses, and for the Taggart uses.

required by the applicant to establish or maintain vegetation cover.

Please provide a revised assessment of water demand for all water uses on site to demonstrate there is sufficient water available under CRC160231.

#### 5. Groundwater level estimates

The groundwater assessment of effects describes the anticipated groundwater levels across the site. An onsite survey was undertaken to identify and measure groundwater levels in bores within the quarry site. Table 2 summarises the depth to groundwater in the bores that remain.

Please confirm if the elevation at each site and the location of the well has been resurveyed as well. What is the quality of this survey (i.e the level of accuracy) and can the new co-ordinates of the well be provided?

The elevation at each bore site and location has been established using LIDAR, so the NZTM grid reference and X and Y references taken from ECan's Well Search is:

Well No.	NZTM Grid. Ref.	X & Y Ref.
M35/0269	BW24:64701-06778	1564701 - 5206778
M35/1686	BW24:64707-06507	1564707 - 5206507
M35/2404	BW24:64801-06578	1564801 - 5206578
	BW24:64701-06498	1564701 - 5206498

The coordinates have not changed as far as we are aware.

The depth given in Table 2 of the Appendix E (Groundwater Assessment) has used the ground level evaluation and depth to water (masal) (columns 5 and 6 of Table 2) from LADIR data (ECan sourced). The actual depth to water (m bgl)(column4 of Table 2) was the measured ("surveyed") depth in 2017. We note that this surveyed depth has been adopted in the ECan Well Search data, referencing the last reading "21 April 2017" when this information was provided to ECan by PDP.

If, or if you are concerned about the level of accuracy between using LIDAR 2018 and the latest LIDAR; our evaluation the level of accuracy is 0.2 mams; being insignificant, when establishing the Taggart proposal (5m, and/or 1m separation distance from actual groundwater).

If actual (surveyed) depth to groundwater were obtained at any time; this would vary. Reference to how Taggart propose to extract, through mainlining 1m separation to actual GW and/or no greater than 5m in depth has been proposed on the basis that extraction to 5m without putting GW at risk, and progressively backfilling with VENM is proposed.

#### 6. Groundwater levels and monitoring

**The proposed conditions in Appendix H to the application are unclear if they are referring to actual groundwater levels or the highest groundwater level. As currently drafted, the conditions seem to limit excavation to no deeper than 1m above the highest groundwater level but we understand that it is proposed to maintain at least 1m separation to the actual groundwater level.**

**Please review the proposed conditions and revise as necessary.**

The suggested conditions and assessment are based on actual groundwater level, however this needs to also be cognizance of the limit of the pit being set to 5m below natural ground levels, and depth from natural ground level to 5m.

To have this included in Appendix H, condition 1 has been re-drafted (in Attachment 5) as follows:

- d. site preparation, topsoil stripping, overburden removal and storage;*
- e. construction and maintenance of bunds and stockpiles;*
- f. extraction of material to no closer than 1 m from monitored groundwater level (at the time of extraction), and no deeper than 5 m below natural ground level;*
- g. transportation, loading, delivery, unloading, deposition and stockpiling of extracted material and backfill material;*
- h. site rehabilitation; and*
- i. movement of vehicles associated with the above activities.*

## **7. Poned water**

**The assessment of effects on groundwater appended to the application as Appendix E states that ponding in open excavations is only likely to occur infrequently and will be for short time prior to the area being backfilled with VENM.**

**Are any specific actions proposed to address any ponded water within the quarry pit? If so, please describe these actions.**

Section 7.3 of the AEE outlines that if ponded stormwater occurs, a sucker truck can be used to remove excess stormwater.

Section 2.2.3 states “The large rises [in groundwater] due to extreme weather events are generally forecast well in advance and sufficient time would be available to backfill the pit to prevent groundwater ponding.”

Section 3.2.1 states “Groundwater ponding in the open excavations is only likely to occur infrequently for relatively short periods of time before the pits are backfilled with VENM material (within 1 day), therefore direct faecal contamination of the aquifers is only likely to take place intermittently and only if birds are present at times in the pit with relatively long intervening periods during which the aquifer would be flushed with clean groundwater. As a result, the aquifer would be in a largely ‘clean’ state and greater filtration would be expected to occur.”

Suggested conditions (Attachment 5) have been amended so that:

- Conditions 8 and 9 of the regional land use consent have been deleted; and
- New conditions 23 and 24 are stated as follows:

	<p>23. Should the groundwater water level increase so that the separation is less than one metre between the measured groundwater levels and the current (at that time) ground level within the quarry site, then the Consent Holder must apply backfill to that area within 24-hours of incident, so as to re-establish a one metre separation distance throughout the quarry site.</p> <p>24. Should groundwater levels rise into the quarry floor during excavation of aggregate or deposition of Virgin Excavated Natural Material, the Consent Holder must notify the CRC Manager within 24 hours.</p>
<p><b>8. Effects of dust discharges on Rangiora Airshed</b></p> <p><b>The site is located in close proximity to the gazetted Rangiora Airshed which is classified as a polluted airshed under the Resource Management (National Environmental Standards for Air Quality) Regulations 2004. The Air Quality Assessment provides a brief assessment of the potential effects of dust discharges of PM10 comparing the site with the monitoring undertaken in Yaldhurst.</b></p> <p><b>Please provide a more detailed cumulative effects assessment which supports why the findings of the Yaldhurst study are applicable to this site, including any limitations of the study. This should include consideration of PM10, PM2.5 and respirable crystalline silica.</b></p>	<p>The potential for air quality effects associated with the operation of the proposed quarry relates almost exclusively to the potential for there to be dust emissions.</p> <p>Particulate matter in the environment generally falls into two categories: suspended and deposited particulate.</p> <p>Suspended particulate matter is dust or aerosol which stays suspended in the atmosphere for significant periods of time.</p> <p>Deposited particulate matter is dust or aerosol which because of its aerodynamic diameter and density, falls from the air. In general terms deposited particulate has a diameter of greater than about 20 µm. It is generally associated with nuisance effects such as soiling.</p> <p>Suspended and deposited particulate arise from many natural and man-made sources. The most important sources globally are volcanoes and wind-blown dust, whilst on a local level, river beds, farms and fields, stationary and mobile combustion sources, road dust, wind-blown soil, pollen, and emissions from industrial processes are contributors.</p> <p>The most significant potential effect from the proposed quarry activities is nuisance associated with dust deposition.</p>

A subfraction of the dust generated by quarry activities will fall into the category of PM<sub>10</sub> which is regulated by a National Environmental Standard for air quality. PM<sub>10</sub> is typically only produced during the crushing process, and as the proposed site will not undertake any processing of the materials extracted the amount of PM<sub>10</sub> emissions from the site will be very low.

A further subfraction of PM<sub>10</sub> is PM<sub>2.5</sub> which is typically produced during the combustion process. The only source of PM<sub>2.5</sub> from the proposed quarry will be from the onsite vehicles. Given the relatively low numbers of vehicle operating onsite (maximum 6 at any one time), and PM<sub>2.5</sub> produced will be negligible compared to the background concentration.

To help understand the potential PM<sub>10</sub> effect from the proposed quarry on the polluted Rangiora airshed Psucker

DP, used data from the monitoring commissioned by ECan around the Yaldhurst quarry area. While the activities occurring at Yaldhurst and not directly comparable to the proposed quarry (with the exception of the type of material quarried), and any conclusions drawn on the proposed quarry based on the Yaldhurst study will be an overestimation of impacts based on the following:

- The size of the Yaldhurst quarries is significantly larger than that proposed by Taggart (230 Ha compared to <5 Ha).
- The scale of the Yaldhurst quarries processing operation is significantly different and larger with at least 4 screening and crushing plants operating at any one time, compared to no material processing on the proposed site.
- The final product from the proposed quarry will have a very low amount of fines and there will be different as there will be no crushing or screening undertaken of the Racecourse site.
- The type of activity (extraction and transport) undertaken by the Yaldhurst quarries is identical to that proposed by Taggart, albeit at a much smaller scale.

As with any monitoring study there is usually limitations, and the main limitations of the Yaldhurst study for the purpose of which we are using the data for are:

- The Yaldhurst study was undertaken over a period of four months (December 2017 to April 2018), which is not a sufficiently long enough period to accurately assess annual average concentrations. However, the monitoring programme was undertaken over the period of the

year with the highest potential for dust events (dry and windy conditions). Therefore, even though the data record is relatively short it is likely to contain concentrations which will represent worst case scenarios.

- A number of the dust monitoring locations, and in particular the location that we used to draw our main conclusions, utilised nephelometer monitors. While these are not a reference method for measuring dust, however they do provide a very good indication of dust concentrations.

Based on our experience measuring PM<sub>10</sub> at other quarries, is that PM<sub>10</sub> from quarry activities is generally not measurable above background levels within a few hundred metres of the crusher. This experience is in line with the findings of the Yaldhurst study. i.e. cumulative effect is less than minor.

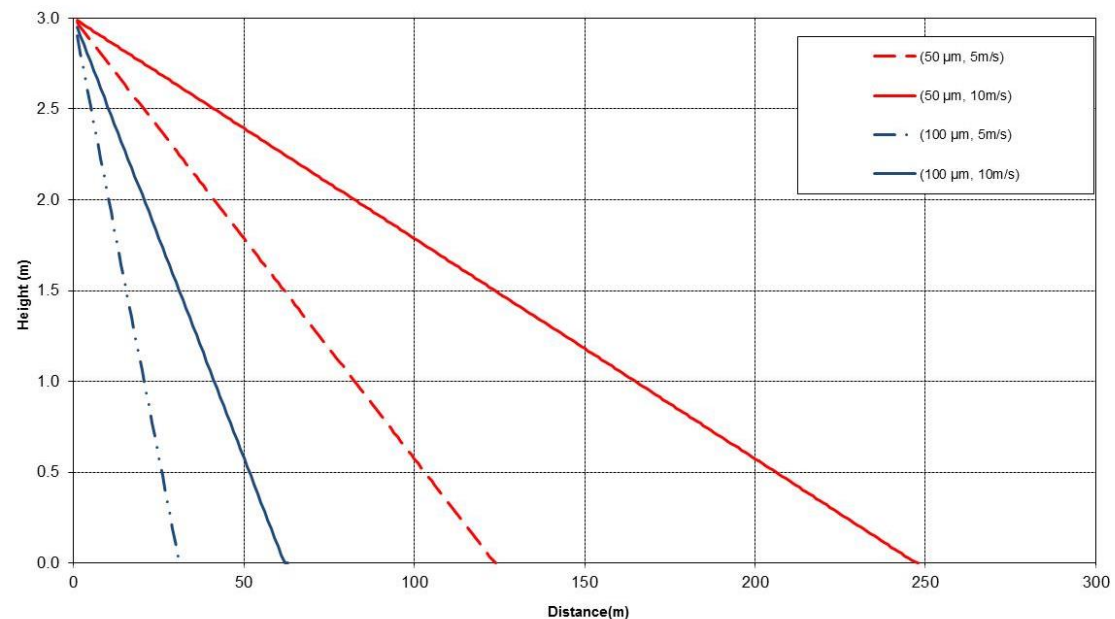
As discussed in the AEE, when you consider the monitoring that was undertaken at Yaldhurst, this monitoring indicated that at a similar distance to what the Taggart quarry would be from the Rangiora airshed, that PM<sub>10</sub> concentrations increased on average by approximately 4 µg/m<sup>3</sup>. However, as the proposed Taggart quarry will be approximately 40 times smaller than the Yaldhurst quarries, the predicted PM<sub>10</sub> concentration from Taggart quarry would be much smaller than the concentrations measured at Yaldhurst. Therefore it is extremely unlikely that Taggart quarry will increase PM<sub>10</sub> concentrations by more than 2.5 µg/m<sup>3</sup> at the airshed boundary.

If you take the conservative approach and assume that the PM<sub>10</sub> concentrations from the proposed Taggart quarry were 10 times smaller than the measurement made at Yaldhurst, the predicted contribution from the Taggart quarry at the airshed boundary would be 0.4 µg/m<sup>3</sup>. If you also take the maximum daily PM<sub>10</sub> concentrations measured by ECan at Rangiora for the summer months (based on 2017-2020 monitoring data) when dust emissions from the quarry have the potential to be at higher than normal, the predicted maximum cumulative effects from the Taggart quarry on the airshed would be approximately 35.8 µg/m<sup>3</sup>.

Respirable crystalline silica (RCS) can also be present in the dust generated by quarry operations, mainly processing rather than extraction. The Yaldhurst study also measured RCS at a number of locations, and the result of the study indicated the RCS at all locations were either below the limit of detection of the sampling method or well below the guideline values. Given the significant

	<p>differences of the proposed to the Yaldhurst study and the non-processing onsite at the Racecourse, the likelihood of RCS generation is very low.</p>
<b>9. Cumulative effects of dust discharges</b>	
<p><b>The site is adjacent to the Ashley River which is likely to be a natural source of dust emissions. Please provide an assessment of the potential cumulative effects of dust discharges from the Ashley River and the site on neighbouring properties and the Rangiora Airshed.</b></p>	<p>As outlined in response to Question 8 the primary pollutant from the proposed activity is likely to be nuisance dust, given that there is going to be no processing on site which would produce PM<sub>10</sub>, and very few combustion sources that would result in PM<sub>2.5</sub> from the site, therefore the greatest potential for cumulative effects is from sources that generate nuisance dust.</p> <p>The figure below depicts the distance potentially travelled by dry material from the quarry for a range of wind speeds based on a particle diameter of 50 to 100 µm. This is a reasonable assumption based on PDP's experience with dust nuisance. The release height in the figure is also typical of the height that dust is released from for a range of quarrying activities. Based on this graph nuisance dust could potential travel up to 300 metres before settling, however with mitigation this distance would be much lower. Therefore, for cumulative effects to occur, sources of nuisance would need to be within 300 metres of each other.</p>





Based on the activities that surround the proposed site, PDP has identified the following potential sources of dust:

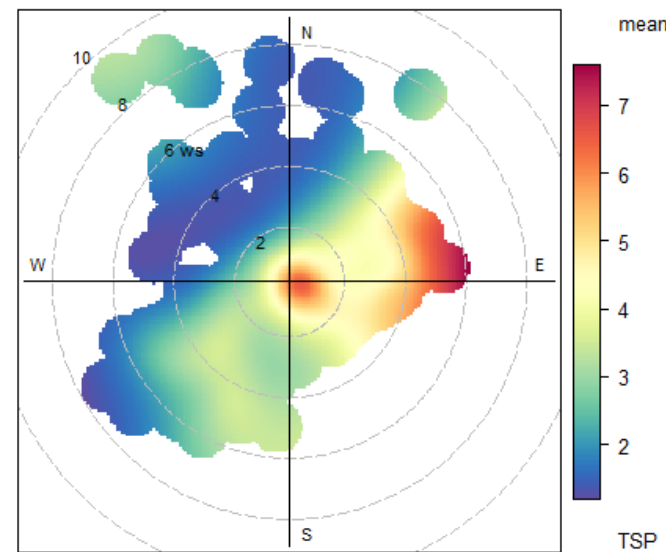
- Racecourse
- Ashley River (approximately 600 metres to the northwest through to the northeast)
- Unsealed tracks/areas outside the stables 300 metres to the south
- Unvegetated paddocks to the west of the holiday park (500 m west of the racecourse)
- Taggart's processing area (Cones Road Yard) 1,500 m to the east northeast
- Immediate Agricultural areas
- The rest of Canterbury plains.

Of these sources it is only the racecourse and the unsealed tracks/area outside the stables that are within 300 metres of the proposed quarry and therefore could result in cumulative effects. Given that Taggart will undertake a number of different mitigation measures the likelihood of dust

traveling 300 metres is low and therefore it is unlikely that there will be any cumulative effects on any of the nearby receptors as a result of nuisance dust.

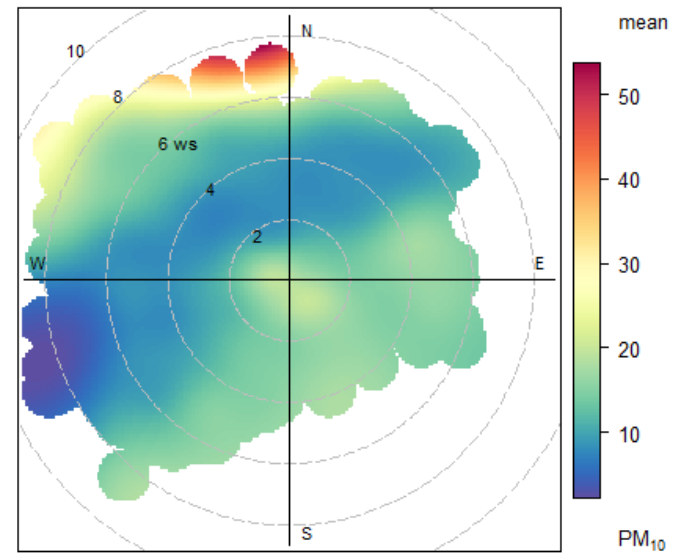
Since late December 2020 PDP has been undertaking TSP monitoring on the western boundary of the site. The figure below presents 1-hour average concentrations of three variables wind speed, wind direction (measured at Rangiora by ECan) and TSP. A coloured dot is placed over the grid for each possible wind direction and speed, with red representing relatively high concentration of TSP and blue indicating low concentrations.

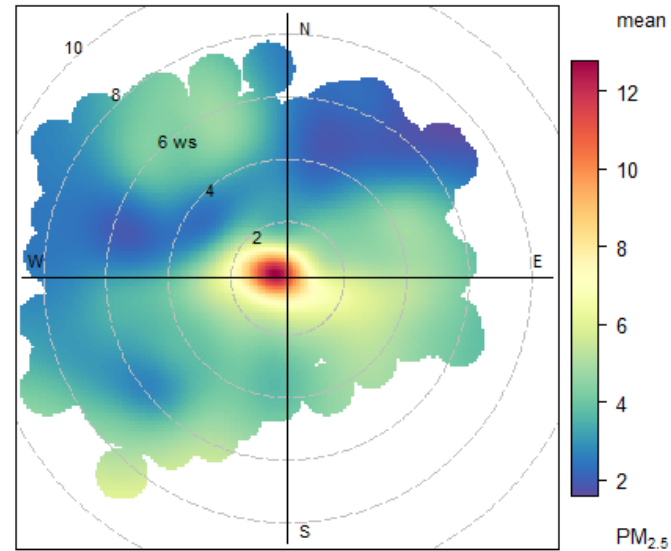
As indicated by the figure below, the highest TSP concentration occur during stronger easterly winds. While there is dust from all directions, the appears to be no other significant source of TSP nearby other than the residential dwellings to the east.



ECAN measures  $PM_{10}$  and  $PM_{2.5}$  near St Josephs School in Rangiora and the images below present the last 3 years of 1-hour average data measured at this location. These figures indicate that highest concentrations of  $PM_{10}$  are coming from the north and  $PM_{2.5}$  concentrations appear to be very localised. Given that the maximum  $PM_{10}$  concentration occur during strong winds ( $>6$  m/s) from the

north and northwest, and there is no significant increase in  $PM_{2.5}$  concentration from this direction could indicate that the source of the  $PM_{10}$  is from the Ashley river.





#### 10. Dust discharge monitoring

**Given there is potentially multiple dust sources in the area, how is it proposed to monitor dust from the site? For example, is it intended to isolate dust discharges from the site from other potential sources? Or will the proposed dust triggers apply to the cumulative dust discharges occurring from the site and elsewhere?**

Refer to condition 5 of Air Discharge Permit in Appendix H (Suggested Conditions of consent), as the Dust Management Plan will provide those specific details. Irrespective of cumulative effects of dust, the dust monitors installed around the site will have a trigger value, and/or wind speed to determine when dust suppressant will be applied. The DMP will provide this specific detail of how and when dust suppressants will be used. To this end, if dust comes from other sites, this may expect dust suppressant on the Racecourse site.

#### 11. Dust management plan

**Due to the proximity of the site to sensitive receptors, it is critical that effective dust mitigation is undertaken to reduce the potential for dust discharges. The application**

The following are issues that the DMP will cover as defined in proposed condition number 5 of Air Discharge Permit in Appendix H. As a starting point for the development of the DMP we have provided some initial information for each of these headings. However, we anticipate that the DMP will evolve based on submitters concerns and other aspects raised during the application process.

and air quality assessment describe the type of mitigation measures that may be used to control dust and it is proposed that during operation, all works will occur in accordance with a dust management plan. However further details of the procedures for responding to dust and standard operating practices would be beneficial to provide a more comprehensive description of the proposed dust mitigation.

Please provide a draft dust management plan that sets out how the proposed dust mitigation measures will be used on site to control dust discharges. The dust management plan should be prepared in accordance with the Ministry for the Environment Good Practice Guide for Assessing and Managing Dust, Appendix 4 and Schedule 2 of the Canterbury Air Regional Plan.

The information below is provided to give an idea of what will be covered in the DMP and the starting point on each of the issues

**1. The AQMP must include, but not be limited to:**

**a. A description of the content and purpose of the AQMP;**

The purpose of the AQMP is to provide a framework for the quarry operations and site personnel, in particular to:

- ∴ facilitate the avoidance, remediation, and mitigation of any adverse effects of discharges of dust generated from the extraction of material and associated processing activities undertaken at the site;
- ∴ promote proactive solutions to the control of dust discharges from the site; and
- ∴ ensure the effective and targeted use of available dust suppression water so that adverse effects of dust discharges are mitigated without exceedance of the water take limit.

**b. A description of the dust sources on site;**

For example earth moving, bund construction, enabling works, haul roads, extraction, stockpiling and transport. More detail of these dust source are currently provided in the AEE.

**c. A description of the receiving environment and identification of sensitive receptors within 250 metres of site boundaries;**

Will also include a map locating all the sensitive receptors within 250 metres of the site boundary.

**d. The methods (including dust reduction through design methodologies) to be used for controlling dust at each source during quarry activities;**

As detailed in the AEE.

**e. A description of site rehabilitation methodology;**

This will include details such as cleanfill acceptance criteria, stockpile on cleanfill, hydroseeding or vegetating final contoured areas.

**f. A description of dust monitoring requirements, trigger levels and methodology;**

**Continuous Dust Monitoring**

The continuous dust (TSP) monitors will be located on the eastern and western boundary, on the basis this area is expected to be subjected to the greatest impact of dust. The number and location of the dust monitors will be reviewed annually.

To ensure that dust mitigation measures are effective and to minimise the risk of any dust impacts beyond the boundary being offensive or objectionable, the site will adopt TSP monitoring trigger limits. A trigger limit is a concentration above which either additional dust mitigation will be implemented, or quarrying activities ceased based on the following TSP monitoring trigger limits:

- ∴ Trigger Level 1 – ( $80 \mu\text{g}/\text{m}^3$  as a 1-hour average) – To identify that dust concentrations have reached a point where dust nuisance is likely to occur if action is not taken to implement mitigation measures. It would not be expected that concentrations would reach this level unless there are adverse weather conditions in conjunction with a failure of mitigation.
- ∴ Trigger Level 2 – ( $160 \mu\text{g}/\text{m}^3$  as a 1-hour average or  $60 \mu\text{g}/\text{m}^3$  as a rolling 24 hour average) – If this trigger is exceeded it indicates that all dust concentrations have reached a level which is unacceptable, and dust nuisance will occur. All activities that have the potential to generate dust on site, apart from dust mitigation, must cease until such a time as dust concentrations drop below Trigger Level 1.

Alerts will be sent to the Site Manager by text and email, where a visual assessment can then be made and appropriate action taken.

#### **Visual Dust Monitoring**

Visual monitoring of dust will be undertaken to assess the level of dust emissions on the site and beyond its boundary. The visual monitoring will:

- ∴ Identify source(s) of dust (e.g. from heavy machinery, stockpiles, earthworks, etc.);
- ∴ Identify any areas of deposited dust from the site on surrounding roads and properties;
- ∴ Assess extent and direction of any dust plumes (e.g. within boundary, cross-boundary, or covering a large extent);
- ∴ Identify receptors potentially impacted by the plume (e.g. properties downwind to the northeast);
- ∴ Assess offensiveness – high, medium, or low; and
- ∴ Assess overall impact – high, medium, or low.

Onsite staff will continuously visually monitor to identify dust events. The Site Manager or delegate shall undertake a site walkover and visual dust monitoring at least once per day, in the early

afternoon, to assess the overall effectiveness of the AQMP and assess compliance with the requirements of the resource consent conditions.

Site observations will be recorded in a daily log form which will be kept for at least 3 years. Recording relevant inspection results, as well as the conditions of external and internal factors on the log forms, will help to assess if control measures are effective and to define appropriate corrective or preventative actions in case any adverse effects occur.

#### **Meteorological Monitoring**

Monitoring of weather forecasts will be undertaken daily and used to inform the potential need for additional mitigation measures (e.g. in the event that strong winds are forecast).

Before the daily briefing meeting, the Site Manager will obtain the weather forecast for the day and identify whether high dust risk conditions may occur. If high dust risk conditions are forecast, the Site Manager will highlight this to other on-site staff and instruct whether any additional dust mitigation is to be implemented for that day.

The forecast occurrence of high dust risk conditions shall be noted in the daily log along with any outcomes from the daily briefing meeting.

The site will have its own meteorological station which measures wind speed, wind direction, and rainfall. The meteorological site telemeters data in real time and has an inbuilt alert system which sends text and email messages to the key staff members. The alert system will be set up to provide warnings when medium and high-risk dust conditions occur to enable additional dust mitigation measures to be put in place as required. The table below shows a summary of the meteorological conditions contributing to different dust risk levels, the associated notifications, and required responses.

Dust Risk Levels, Meteorological Conditions and Responses				
Dust Risk Level	Wind Speed	Wind Direction (blowing from)	Notification	Response
Low	< 5 m/s	All directions	-	-
Medium	5 – 7 m/s		Text & email	Prepare for mitigation actions, visual inspection of dust discharges and implement water application for dust suppression if required
High	≥ 7 m/s		Text & email	Operators to visually identify potentially sensitive receptors in downwind direction and to use Tier 1 & Tier 2 dust mitigation measures as appropriate

#### Frequency of Monitoring

The table below outlines the frequency of the activities undertaken as part of the monitoring programme.



Monitoring Programme Activities and Frequency	
Monitoring Activities	Frequency
Check weather forecasts for strong winds and rainfall to plan appropriate activities and dust management response (7-day forecasts also available on <a href="http://www.metsvw.com">www.metsvw.com</a> and <a href="http://www.metservice.com">www.metservice.com</a> ).	Daily and as conditions change
Visual dust monitoring early afternoon site walkover.	Daily
Inspect site access and egress points to ensure dust is being contained to within the site.	Daily
Daily log form for visual monitoring of dust.	Daily.
Inspect watering systems (water carts and any other spray system) to ensure equipment is maintained and functioning to effectively dampen exposed areas.	Weekly
Inspect dust generating activities to ensure dust emissions are effectively controlled.	Ongoing
Monitor dust generating activities and water application rate.	In winds over 7 m/s.

#### Reporting of Monitoring Programme

The following information will be recorded in a daily log or equivalent system:

- ✧ Results of the daily site inspections of visible dust emissions;
- ✧ Likely source(s) of any observations of dust;
- ✧ General weather conditions during the day (i.e., windy, calm, warm, rain etc.);
- ✧ The frequency of use of the water cart;
- ✧ Dust control equipment malfunctions and any remedial action(s) taken;

- ✧ Any unusual on-site activities; and
- ✧ Records of any complaints or other community feedback regarding the quarry activities.
- ✧ Continuous TSP and Meteorological data.

The log forms will be collated and stored on site and will be made available to ECan staff upon request.

**g. A description of procedures for responding to dust and wind condition-based trigger levels and associated follow up investigations and recording of findings;**

As per the above

**h. A system for training employees and contractors to make them aware of the requirements of the AQMP;**

Successful dust management depends on appropriate actions by site personnel in day-to-day operations of the site. Environmental training for all staff will be undertaken as part of the site induction programme. The environmental induction will include the following information specific to this AQMP:

- ✧ Information about the activities that may cause dust discharges within the site with the potential to impact neighbouring areas;
- ✧ Consent requirements;
- ✧ Dust mitigation procedures;
- ✧ Description of dust and meteorological monitoring for the site; and
- ✧ Complaints management procedures.

Staff training records will be maintained on site. The records will include:

- ✧ Who was trained;
- ✧ When the person was trained; and
- ✧ General description of training content and whether follow up/refresher courses are required at a later date.

**i. Names and contact details of staff responsible for implementing and reviewing the AQMP;**

The Site Manager will have day-to-day responsibility for the implementation of the AQMP. The Site Manager will have the following responsibilities in respect of the management of dust. They shall ensure

- ✧ That the conditions of all relevant resource consents are complied with at all times;
- ✧ That the dust control and mitigation measures and procedures outlined in the AQMP are implemented effectively;
- ✧ That there are adequate personnel and equipment on site at all times to enable the prescribed dust control;
- ✧ That the meteorological and dust monitoring programmes are carried out as required, including recording of daily observations;
- ✧ That any complaints received are investigated and resolved as far as practicable; and
- ✧ That all records are kept and are available to the relevant regulatory authorities.

All personnel working on the Project have responsibility for following the requirements of the air discharge consent conditions and the AQMP and reporting to the Site Manager on these issues.

**j. Procedures, processes and methods for managing dust when staff are not on site;**

Possible option available is to dampen down surfaces at the end of every day during dry conditions, using the dust monitors and met stations onsite to send alarms to on call staff, or having sprinklers set up to operate based on triggers from the dust and met station monitors. On call staff who reside in Rangiora can be deployed within short timeframes onsite for further mitigation additional to the automated dust suppressant systems.

**k. Methods for determining the weather conditions that will trigger a restriction on potentially dusty activities;**

High risk conditions are likely to include windspeeds above 7m/s blowing from the NW or East. Specific wind speeds and directions will be determined from the on-site monitoring data.

**l. A method for recording and responding to complaints from the public;**

It is important to ensure that any complaints are recorded and promptly investigated to identify and resolve the cause of the complaint. Requirements and procedures for complaints are detailed below.

The Site Manager has the responsibility to respond to and follow up all complaints regarding dust, and to ensure that suitable trained personnel are available to respond to complaints at all times. Actions to be taken as soon as possible, following the receipt of a complaint, by the Site Manager include:

- ✧ Undertake a site inspection. Note all dust-producing activities taking place and the mitigation methods being used, take photographs for reference as appropriate. If the complaint was related to an event in the recent past, where possible, note any dust-producing activities taking place at that time;
- ✧ Initiate any remedial action necessary, which may include a stop work period;
- ✧ Note the time and date of the complaint/s and (unless the complainant refuses to provide them) the identity and contact details of the complainant. Ask the complainant to describe the discharge:
  - Is it constant or intermittent?
  - How long has it been going on for?
  - Is it worse at any time of day?
  - Does it come from an identifiable source?
- ✧ Meteorological data from the on-site station shall be downloaded;
- ✧ Note if the complaint has been referred to the ECan;
- ✧ As soon as possible (within 1 hour, where practicable), visit the area from where the complaint originated to ascertain if dust is still a problem;
- ✧ If it becomes apparent that there may be a source of dust other than the quarry activities causing the complaint, it is important to verify this. Photograph the source and emissions;
- ✧ As soon as possible after initial investigations have been completed, contact the complainant to explain any problems found and remedial actions taken. Initiate a damage assessment if required; and
- ✧ If necessary, update any relevant procedures to prevent any recurrence of problems and record any remedial action taken.

#### **Response Procedure**

Following the receipt of the complaint, the following actions will be undertaken:

- ✧ Fill out the appropriate complaint form;

- ∴ Advise the Site Manager and the ECan within 48 hours that a complaint has been received, what the findings of the investigation were, and any remedial action taken;
- ∴ Advise site personnel as soon as is practicable that a complaint has been received, what the findings of the investigation were, and any remedial action taken; and
- ∴ Call or visit the complainant to update them on the actions taken and to check that the issue has been resolved.

**m. A maintenance schedule for meteorological and particulate (including PM<sub>10</sub>) monitoring instruments;**

Maintenance of the meteorological and particulate monitors will be undertaken in accordance with the manufactures specifications. This will be determined once the monitoring equipment as been selected.

**n. Separate Standard Operating Procedures (SOPs) dedicated to the management of potential dust discharges from specific sources, including but not limited to:**

- i. Stockpiles;
- ii. Site roads – sealed and unsealed;
- iii. Aggregate excavation and backfilling areas;
- iv. Top soil and overburden stripping and stockpiling;
- v. Bund construction and the recontouring of slopes during rehabilitation;
- vi. The automated dust suppression for dust prone areas that can be activated outside of working hours;
- vii. Location and calibration of PM<sub>10</sub> and meteorological monitoring equipment;

**Attachment 3**  
**Floor level survey results**

Address	Location	Estimated Floor Level	Average Lidar across Floorplate	Maximum Modelled WL – Pre	Q100	Difference (mm)	Maximum Modelled WL – Pre	Q200	Difference (mm)	Maximum Modelled WL – Pre	Q500	Difference (mm)
					Maximum Modelled WL - Post			Maximum Modelled WL - Post			Maximum Modelled WL - Post	
<b>109 River Road</b>	House	40.51	40.44	40.75	40.75	-	40.77	40.76	-10	40.81	40.78	-20
<b>331 West Belt Road</b>	Back Shed	41.85	41.72	-	-	-	41.69	41.69	-	41.76	41.72	-40
<b>331 West Belt Road</b>	House	41.73	41.58	41.67	41.68	-	41.690	41.68	-10	41.75	41.71	-40
<b>331 West Belt Road</b>	Out house	41.80	41.62	-	-	-				41.64	41.620	-20
<b>335 West Belt Road</b>	House	41.80	41.63	41.72	41.72	-	41.740	41.73	-10	41.80	41.76	-40
<b>336 West Belt Road</b>	House	41.68	41.32	-	-	-	41.46	41.46	-	41.50	41.48	-20
<b>337 Lehmans Road</b>	Prefab Square	47.87	47.43	-	-	-						-
<b>337 Lehmans Road</b>	Reception	48.15	47.50	47.15	47.04	-110	47.17	47.06	-100	47.20	47.14	-70
<b>337 Lehmans Road</b>	Hall	48.06	47.44	47.15	-	-	47.17	-	-	47.21		
<b>337 Lehmans Road</b>	Triangle Prefab	47.25	47.19	47.15	-	-	47.17	-	-	47.21	47.12	-90
<b>337 Lehmans Road</b>	Toilet Block	47.07	47.05	47.18	47.10	-70	47.19	47.12	-70	47.23	47.17	-50
<b>359 Lehmans Road</b>	House (Low)	47.23	47.09	47.13	47.36	230	47.14	47.45	310	47.21	47.61	410

<b>359 Lehmans Road</b>	House (High)	47.40	47.09	47.13	47.36	230	47.14	47.45	310	47.21	47.61	410
<b>373 Lehmans Road</b>	House	47.79	47.36	-	-	-	-	47.45	90	-	47.61	250
<b>379 Lehmans Road</b>	Western House	48.30	47.98	-	-	--	-	-	-	-	-	-
<b>379 Lehmans Road</b>	Eastern house	47.78	47.49			-	-			-	47.613	120

**Notes:**

All values are reported as m above Vertical Datum NZVD2016 unless otherwise stated.

For difference values, a negative value indicates that the predicted water level in the post-development scenario is lower than the pre-development scenario. Where no results are shown, surface inundation is not predicted within the building extent for the modelled event.

Floor levels in **BLUE** were taken using a tape measure on the outside of the building to the floor level. No one was home during site visit. These values should be taken as approximate. The floor level relative to the measured location was unknown.

311 West Belt Road was inaccessible and therefore, no site measurements were taken.

Field measurements took the depth from the floor level to ground level. The measuring point was located on GIS and a lidar value was taken as the ground level at the site. The measured depth was added to estimate the floor level for the building footprint (obtained from LINZ).

Pre and post modelled maximum predicted water levels were taken over the building footprint. The difference between these values is the expected change in flooding for the property as a result of the proposed works. Where no surface inundation was predicted, for the purpose of difference calculations, the average ground level measured by LiDAR survey was taken.

Values in **RED** show increase in flood level. Values shown in **Orange Cells** show an exceedance of estimated floor level.

#### **Attachment 4**

##### **Flood modelling results with breached western bund**

PDP has undertaken preliminary re-modelling of flood water diversion during a Q100 event. The scenario shown in the two figures is to be compared with the flood modelling results attached to the AEE.

In the scenario modelled and shown below, the western bund is deliberately breached and a 10 m wide gap excavated in the location shown (approximately opposite the dwelling at 359 Lehmans Road). This gap is accompanied by a 0.5 m excavation below ground level. Ordinarily the bund would remain intact, and these excavation works would be undertaken immediately in the event that Environment Canterbury issues a flood warning for the Ashley River/Rakahuri. The intent of the works is to create a preferential flow path for flood waters flowing west to east and entering the vicinity of 359 Lehmans Rd. This gap is intended to allow flood waters to enter the Racecourse site rather than be diverted by the bund.

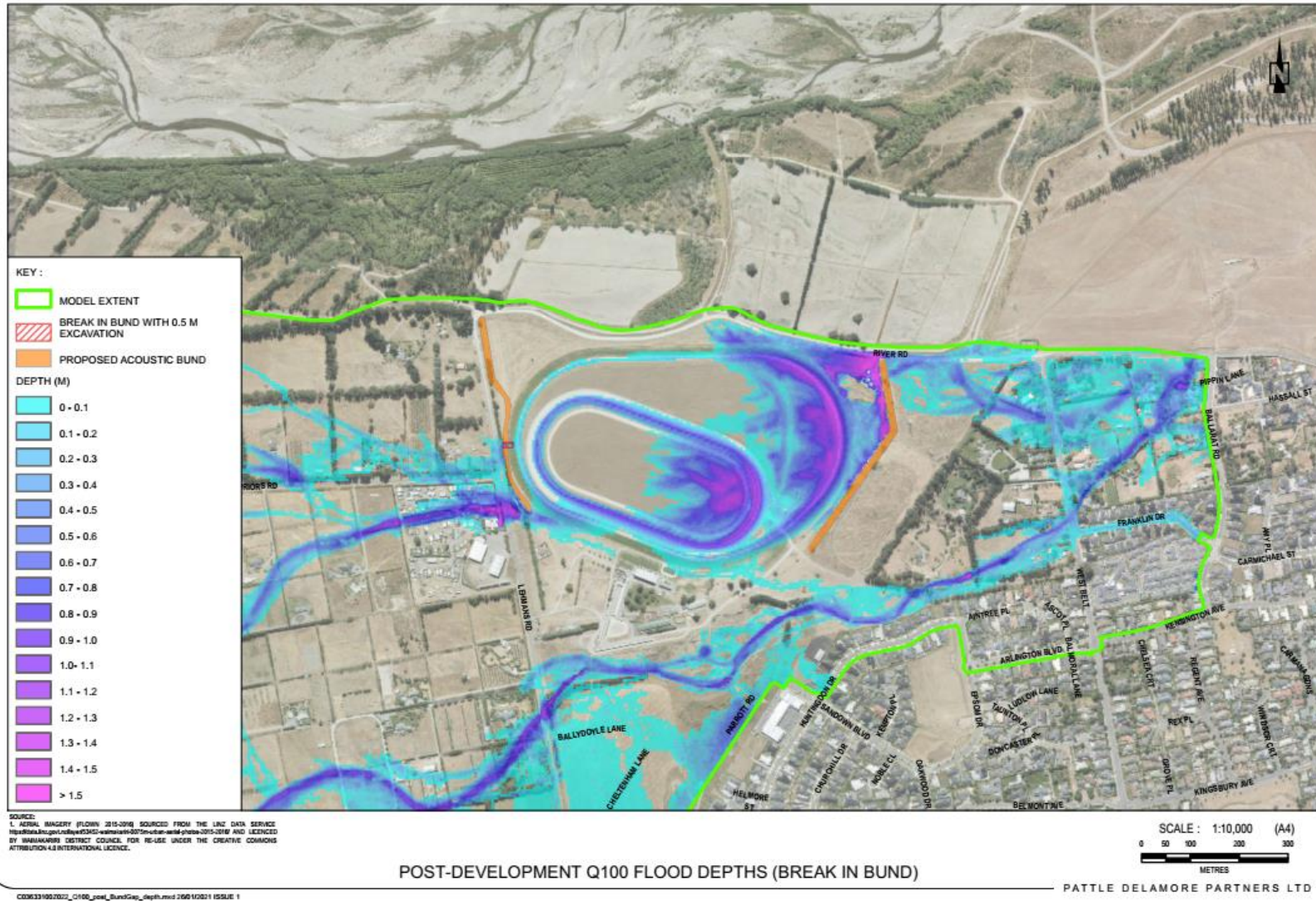
A consent condition to this effect has been drafted and is included in Attachment 5:

*If Environment Canterbury issues a flood warning for the Ashley River/Rakahuri of Q100 or greater, the Consent Holder shall immediately, at or about the location shown on Figure X:*

- a) excavate an opening of no less than 10 m width through the western bund;*
- b) excavate a trench no less than 0.5 m in depth through the opening; and*
- c) maintain the open excavations in the bund until the Ashley River/Rakahuri is no longer subject to a current flood warning from Environment Canterbury.*

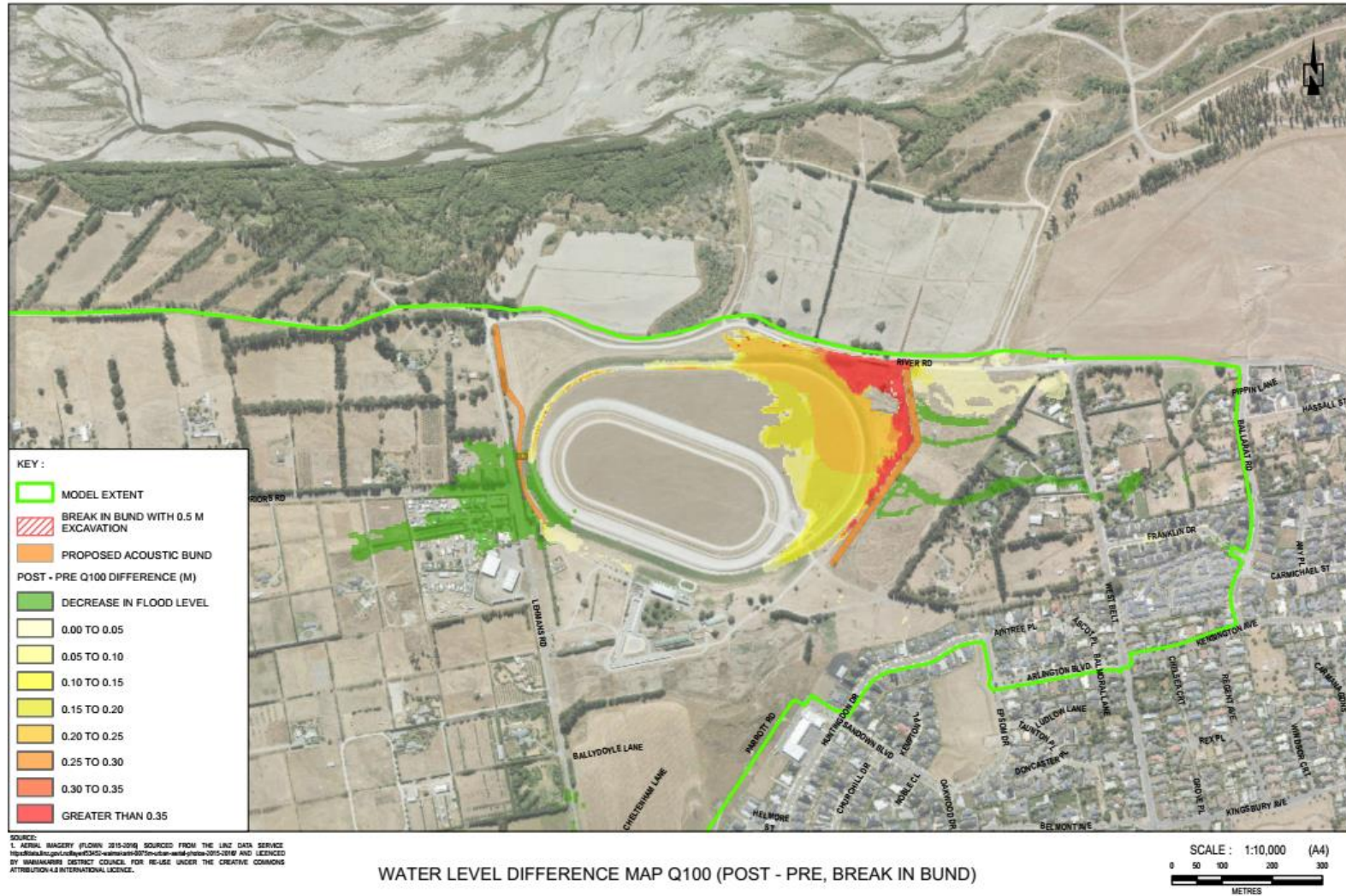
The two figures below show the efficacy of the bund breach. The first figure shows actual modelled flood water depths during a Q 100 event. The second figure shows the difference in flood water depths between a breached and unbreached bund, with a reduction in flood water diversion and depth shown throughout the area around the Lehmans Rd/Priors Rd intersection.





C:\3633\1027027\_0100\_pos\_BundGap\_Depth.mxd 2/6/2021 1:55:01 PM





SOURCE:  
1. AERIAL IMAGERY (FLOREN 2015-2016) SOURCED FROM THE LINZ DATA SERVICE  
http://data.linz.govt.nz/dataset/43450-remote-sensing-photos-2015-2016 AND LICENCED  
BY WAIMANUWU DISTRICT COUNCIL FOR RE-USE UNDER THE CREATIVE COMMONS  
ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

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**Attachment 5**  
**Amended suggested consent conditions**

**Conditions applying to all resource consents**

**Authorised Activities**

2. These consents authorise the following list of activities undertaken at ~~xxx~~ Rangiora Racecourse, legally described as LOT 1 DP 15758 RS 10449 19334 PT RS 1806 10009 BLK VI RANGIORA SD~~xxxx~~, at or about map reference 1,564,979 / 5,206,833 metres (NZTM) ~~xxxx~~ as shown on Plan A attached to and forming part of these resource consents:
  - a. ~~s~~Site preparation, topsoil stripping, overburden removal and storage;
  - b. ~~c~~Construction and maintenance of bunds and stockpiles;
  - c. ~~e~~Extraction of material to no closer than 1 m from monitored groundwater level (at the time of extraction), and no deeper than 5 m below natural ground level;-
  - ~~e.d.~~ ~~t~~ransportation, ~~l~~loading, delivery, unloading, ~~d~~eposition and stockpiling and ~~t~~ransportation of extracted material and backfill material;
  - ~~d.~~ ~~S~~tockpiling of aggregates and backfill;
  - ~~e.~~ ~~D~~eposition of backfill;
  - ~~f.e.~~ ~~s~~Site rehabilitation; and
  - ~~g.f.~~ ~~m~~Movement of vehicles associated with the above activities.
3. Backfill shall be only virgin excavated natural materials (VENM) that are free of:
  - a. combustible, putrescible, degradable or leachable components;
  - b. hazardous substances or materials (such as municipal solid waste) likely to create leachate by means of biological breakdown;
  - c. products or materials derived from hazardous waste treatment, stabilisation or disposal practices;
  - d. materials such as medical and veterinary waste, asbestos, or radioactive substances that may present a risk to human health if excavated;
  - e. contaminated soil and other contaminated materials; and
  - f. liquid waste.
4. Gravel, sand and other natural material shall not be excavated within 50 metres of Transpower's National Grid transmission lines, including support structures.

**Prior Notice**

5. The Consent Holder must inform the Canterbury Regional Council, Attention RMA Monitoring and Compliance Manager ("the CRC Manager") of the date on which these resource consents are first exercised.
6. At least one month prior to commencement of quarry activities authorised by these consents, the Consent Holder or their agent must arrange and conduct a site meeting with the CRC Manager. At a minimum, the following must be covered at the meeting:

- a. Scheduling and staging of the works, including the proposed start date;
- b. Responsibilities of all relevant parties;
- c. Contact details for all relevant parties;
- d. Expectations regarding communication between all relevant parties and the person in charge;
- e. Site inspections; and
- f. Confirmation that all relevant parties have copies of the contents of these consent documents and all associated management plans.

### **Preliminary Works**

7. The following site management works must be undertaken prior to quarry activities commencing:
  - a. Construction of site access off River Road as shown in Plan B;
  - b. Installation of fencing around the perimeter of the site including lockable gates at the River Road entrance;
  - c. Installation of warning notices able to be read from a distance of five metres at the River Road entrance stating or showing as a minimum:
    - i. The name of the site;
    - ii. The name of the owner of the operation and a contact telephone number;
    - iii. That groundwater is vulnerable to contamination;
    - iv. That access ~~is restricted~~ to the site is restricted;
    - v. The spatial extent of the site, showing where access is restricted; and
    - vi. That no materials may be discharged, disposed of within the site perimeter without express permission from the Consent Holder.
8. Site access, fencing and signage in Condition 64 shall be maintained for the duration of this consent.

### **Bund Formation**

9. Prior to commencing quarrying operations, the Consent Holder must establish vegetated earth bunds as shown on Plan A.
10. The bunds must remain in place for the duration of quarrying and backfilling operations, until after final site completion (except as provided for in Condition 13).
11. The bunds must be compacted to minimise top soil loss and be at least three metres high, with a one metre wide flat top, a base width of between 7 to 15 metres and an outside slope of no more than 1:1 (one metre vertical to one metres horizontal), with an option of bunds being 1.5 metres in height and a 1.5 metre high timber fence.
12. As soon as practicable, but within 14 days following their construction, the bunds must be sown or hydro-seeded with grass (or another suitable vegetative cover).
13. Prior to grass (or another vegetative cover) being established, bunds must be watered when required to suppress windblown dust. The bunds must ~~thereafter~~ be regularly watered to ensure grass (or another vegetative cover) is maintained for the duration of consent with at least 80 percent coverage.

14. If Environment Canterbury issues a flood warning for the Ashley River/Rakahuri of Q100 or greater, the Consent Holder shall immediately, at or about the location shown on Figure X:
- a. excavate an opening of no less than 10 m width through the western bund;
  - b. excavate a trench no less than 0.5 m in depth through the opening; and
  - a-c. maintain the open excavations in the bund until the Ashley River/Rakahuri is no longer subject to a current flood warning from Environment Canterbury.

### **Management Plan Certification Process**

- 13.15. The following Quarry and Backfill Management Plans must be submitted to the CRC Manager in electronic and hard copy form for certification at least 40 working days prior to the commencement of quarry activities:
- a. Quarry and Backfill Management Plan (QBMP), that includes spill management, and noise management matters.
  - b. Air Quality Management Plan (AQMP)

Advice Note: The certification process is confined to confirming that a Management Plan adequately gives effect to the relevant Condition(s).

- 14.16. Works to which a Management Plan relates must not commence until the Consent Holder has received written certification from the CRC Manager.
- 15.17. If the Consent Holder has not received a response from the CRC Manager within 20 working days of the date of submission of the Management Plan, the Management Plan must be deemed to be certified.
- 16.18. If the CRC Manager's response is that they are not able to certify the Management Plans, they must provide the Consent Holder with reasons and recommendations for changes to the Management Plan in writing. The Consent Holder must consider any reasons and recommendations of the CRC Manager and resubmit an amended Management Plan for certification.
- 17.19. If the Consent Holder has not received a response from the CRC Manager within five working days of the date of resubmission under Condition 15 above, the Management Plans must be deemed to be certified.
- 18.20. Copies of the certified Management Plans shall be retained on site at all times and all personnel working on the site shall be made aware of their content and have access to them.

### **Complaints Register**

- 19.21. The Consent Holder shall maintain a Complaints Register. The Complaints Register must include details of when a complaint was received by the Consent Holder, the steps taken by the Consent Holder to investigate the complaint, and any steps taken to address the issue raised. The Ceomplaints Register must be provided to the CRC Manager annually, and must otherwise be available to the CRC Manager on request.
- 20.22. For dust complaints the Complaints Register must include:
- a. The location where dust was detected by the complainant;
  - b. The date and time when dust was detected;
  - c. A description of the wind speed and wind direction when the dust was detected by the complainant;

- d. The most likely cause of the dust detected;
- e. Any corrective action undertaken by the Consent Holder in accordance with the AQMP to avoid, remedy or mitigate the dust detected by the complainant; and
- f. Any other corrective actions undertaken.

#### **Site Rehabilitation**

21-23. Progressive and final rehabilitation of the site must be undertaken in accordance with the certified QBMP.

#### **Consent Lapse**

22-24. The lapsing date for the purposes of section 125 of the Resource Management Act 1991 is five years from the date of issue of these consents.

N.B. Advisory: The duration of the consents sought is 15 years to complete the quarry and backfilling of the entire site.

#### **Review condition**

23-25. The Canterbury Regional Council may, once per year, on any of the last five working days of May or November, serve notice of its intention to review the conditions of these consents for the purposes of:

- a. Dealing with any adverse effect on the environment which may arise from the exercise of these consents and which it is appropriate to deal with at a later stage;
- b. Amending dust suppression requirements;
- c. Amending suspended particulate (dust) and groundwater monitoring requirements;
- d. Ensuring compliance with any relevant National Environmental Standards; and
- e. Avoiding, remedying, mitigating, off-setting or compensating for any adverse effects on human health arising from suspended particulate matter generated by quarry activities.



## **Discharge permit – to air**

### **DISCHARGE PERMIT - TO DISCHARGE CONTAMINANTS INTO AIR FROM AN INDUSTRIAL OR TRADE PREMISE OR PROCESS**

#### **General conditions**

2. The Person in Charge, or another nominated person, must be available at all times (including outside quarry operation hours) to respond to dust emission complaints and issues in accordance with measures described in the AQMP.

#### **Air Quality Management Plan (AQMP)**

3. Prior to the commencement of quarry activities, the Consent Holder must prepare ~~and implement~~ an Air Quality Management Plan for the certification of the CRC Manager (in accordance with the process described in consent CRC-XXXX Conditions 11-15 and implement the AQMP once certified).
4. The exercise of this consent must be undertaken in accordance with the certified AQMP.

**Advice note:** The purpose of the AQMP is to:

- identify the best practicable options (BPO) for complying with the conditions of this consent
  - provide detail on how the chosen BPO(s) will ensure the conditions of this consent will be complied with; and
  - implement the ~~ese~~ BPO(s).
5. Prior to submitting the AQMP to the CRC Manager the Consent Holder must have the ~~DMP AQMP~~ reviewed by a Suitably Qualified and Experienced Practitioner (SQEP) in air quality to confirm that the measures proposed in the ~~DMP AQMP~~ are appropriate to achieve compliance with conditions of this consent and enable the management of discharge of dust beyond the boundary to a level that is not offensive, objectionable, noxious or dangerous.
  6. The AQMP must include, but not be limited to:
    - a. A description of the content and purpose of the AQMP;
    - b. A description of the dust sources on site;
    - c. A description of the receiving environment and identification of sensitive receptors within 250 metres of site boundaries;
    - d. The methods (including dust reduction through design methodologies) to be used for controlling dust at each source during quarry activities;
    - e. A description of site rehabilitation methodology;
    - f. A description of dust monitoring requirements, trigger levels and methodology;
    - g. A description of procedures for responding to dust and wind condition-based trigger levels and associated follow up investigations and recording of findings;
    - h. A system for training employees and contractors to make them aware of the requirements of the AQMP;
    - i. Names and contact details of staff responsible for implementing and reviewing the AQMP;
    - j. Procedures, processes and methods for managing dust when staff are not on site;

- k. Methods for determining the weather conditions that will trigger a restriction on potentially dusty activities;
  - l. A method for recording and responding to complaints from the public;
  - m. A maintenance schedule for meteorological and particulate (including PM<sub>10</sub>) monitoring instruments;
  - n. Separate Standard Operating Procedures (SOPs) dedicated to the management of potential dust discharges from specific sources, including but not limited to:
    - i. Stockpiles;
    - ii. Site roads – sealed and unsealed;
    - iii. Aggregate excavation and backfilling areas;
    - iv. Top soil and overburden stripping and stockpiling;
    - v. Bund construction and the recontouring of slopes during rehabilitation;
    - vi. ~~The Any~~ automated dust suppression for dust prone areas that can be activated outside of working hours;
    - vii. Location and calibration of PM<sub>10</sub> and meteorological monitoring equipment;
  - o. Environmental information management for recording, quality assurance, archiving and reporting the quantity and types of data including all ambient environmental data for wind, rainfall-evaporation, PM<sub>10</sub> concentrations, RCS concentrations, community feedback, and all data required for dust management of the site; and
  - p. A copy of the SQEP's peer review report.
7. The AQMP (including the SOPs) must be reviewed by a SQEP, at least every two years, to ensure it remains fit for purpose. Any amendments to the AQMP must be subject to certification by the CRC Manager in accordance with conditions 10-15 of resource consent CRC-XXXX.

### **Dust Mitigation**

8. If quarry activities cause real time particulate concentrations at the site boundaries to reach or exceed a PM<sub>10</sub> concentration of 160 micrograms per cubic metre, as a 1-hour average updated every ten minutes, or 60 micrograms per cubic metre as a rolling 24 hour average, then:
- a. quarry activities (except dust suppression measures) must cease and
  - b. must not resume until PM<sub>10</sub> concentration is less than 160 micrograms per cubic metre, as a 1-hour average updated every ten minutes, or 60 micrograms per cubic metre as a rolling 2 hour average.
9. Quarry activities (except dust suppression measures) within 250 metres of a sensitive receptor location must not be undertaken when:
- a. wind speed reaches or exceeds 7 m/s (10-minute average); and
  - b. quarry activities would be directly upwind of a sensitive receptor (10-minute average wind direction).
10. If at any time, including outside normal operating hours, visible dust is blowing beyond the site boundary or if the PM<sub>10</sub> monitoring trigger in Condition 7 is breached the Consent Holder must:



- a. Cease all quarry activities (except dust suppression measures);
  - b. Continue all dust suppression activities including but not limited to the immediate watering of both active and inactive exposed surfaces;
  - c. Investigate possible sources of the dust;
  - d. Only resume quarry activities (other than dust suppression) once there is no longer visible dust blowing beyond the site boundaries and when the monitoring trigger in Condition 7 is no longer being breached; and
  - e. Notify the CRC Manager within one working day of the dust event, including its cause and the dust suppression actions undertaken.
11. The Consent Holder must take all reasonably practicable measures to minimise the discharge of dust from quarry activities, including but not limited to:
- a. Assessing weather and ground conditions (wind and dryness) at the start of each day and ensure that applicable dust mitigation measures and methods are ready for use prior to commencing quarry activities;
  - b. Taking wind direction and speed into account in planning quarry activities to minimise the risk of dust dispersion towards any residential dwellings that are within 250 metres of the site boundary;
  - c. During site preparation, limiting the height of topsoil and overburden and aggregate stockpiles to no more than three metres above natural ground level;
  - d. Limiting and extracted aggregate and imported VENM stockpiles to no more than 5 m in height above natural ground level;
  - d.e. During quarrying operations, locating temporary stockpiles of processed aggregate within the quarry floor area below natural ground level;
  - e.f. Vegetating any long-term stockpiles (Stockpiles A and B) of topsoil, overburden or unprocessed aggregate;
  - f.g. Regularly vacuum sweeping sealed areas;
  - g.h. Constructing and maintaining unsealed internal roads so that they are comprised of an aggregate base, with surfaces that are graded and free of potholes;
  - h.i. Minimising drop heights when loading trucks and when moving material;
  - i.j. Pre-dampening topsoil and overburden with a water cart or sprinklers prior to its extraction and removal;
  - j.k. Carrying out land stripping and land rehabilitation during favourable weather conditions when winds are below 7 m/s;
  - k.l. Undertaking routine onsite and offsite inspections of visible dust emissions and deposited dust throughout each day of quarry activities and electronically logging findings and any dust suppression actions, and to make the results of the inspections available to ECan when requested;
  - l.m. Maintaining an adequate and “ready to deploy” supply of water and equipment on site for the purposes of dust suppression at all times;
  - m.n. Imposing a speed restriction on all internal roads of 15 kilometres per hour at all times and clearly signposting this limit on all internal roads;

~~A.O.~~ Using water carts as a back-up measure for dust suppression during dry weather;  
and

~~B.P.~~ Using water from bore M35/9270 (Consent CRC160231) on the site together with  
water stored in tanks or similar vessels for dust suppression purposes.

12. The discharge of dust and/or particulate matter from the gravel extraction and/or wider activities within the site shall not create any dust hazard or nuisance to Transpower's National Grid transmission lines, including support structures.

## **Land use consent – quarrying and backfilling**

### **LAND USE CONSENT TO EXCAVATE MATERIAL and TO BACKFILL MATERIAL OVER AN UNCONFINED/SEMI-CONFINED AQUIFER AND THE ASSOCIATED DISCHARGE OF CONTAMINANTS TO LAND**

#### **Extraction Depth**

1. A surveyed datum point at natural ground level must be:
  - a. Established prior to undertaking quarry activities;
  - b. Maintained for the duration of this consent; and
  - c. Used to determine the depth of excavation at any point within the site.
2. Prior to the excavation of overburden, the Consent Holder must survey the site to determine elevations of the natural ground level of the site relative to Mean Sea Level. The survey must be undertaken by a registered surveyor to an accuracy of +/-50 millimetres vertically and be provided to the CRC Manager.
3. Once aggregate extraction has commenced the Consent Holder must undertake, at three monthly intervals or otherwise on request from the CRC Manager, a laser level survey of all depths of excavated and filled areas on the site. The survey must be provided to the CRC Manager. The survey is not required if there has been no excavation in the preceding three-month period. Alternative methods for achieving this condition, such as GPS depth technology on excavation machinery may be used subject to approval in writing from the CRC Manager.
4. In February of each year, utilising the survey data obtained under Condition 3, the Consent Holder must produce a contour map showing the surveyed maximum quarry depth relative to the highest recorded groundwater level for the site derived from the groundwater level data obtained from Condition 6 and provide that map to the CRC Manager.
5. Excavation of aggregate and deposition of backfill must only occur where the quarry floor maintains at least one metre separation depth to groundwater.

#### **Groundwater Level Monitoring**

6. For the duration of this consent, the Consent Holder must monitor and record the groundwater levels daily in the XX bores as follows:
  - a. Upgradient
    - i. X
  - b. Downgradient
    - i. X
  - c. Within proximity of extraction/backfill works, a standing pipe
    - i. X
7. At all times and in all circumstances, the Consent Holder must limit excavation to one metre above the highest recorded groundwater level for the site (derived from the groundwater level data obtained under Condition 6.) for the site, referenced to the datum point in Condition 1.

- ~~8. Should the groundwater water level increase so that the separation is less than one metre between the measured groundwater levels and the current (at that time) ground level within the quarry site, then the Consent Holder must apply backfill to that area within 24 hours of incident, so as to re-establish a one metre separation distance throughout the quarry site.~~
- ~~9. Should groundwater levels rise into the quarry floor during excavation of aggregate or deposition of Virgin Excavated Natural Material, the Consent Holder must notify the CRC Manager within 24 hours.~~

### **Water Quality Monitoring**

~~10.8.~~ The consent holder shall install a downgradient bore (location to be determined based on approaches to landowners, or as a default the location of the water quality monitoring bore shall be on the access leg to the Racecourse off West Belt) for water quality sampling, that shall establish the parameters (identified in condition #) in the first 12 months. The location of the downgradient bore shall be submitted to the consent authority prior to commencement of any quarry or backfilling activities.

~~11.9.~~ The consent holder shall monitor and undertake analysis of groundwater quality from the samples for the following elements and parameters (to be included after 12 months), as determined after the first 12 months of monitoring. The frequency of sampling shall be every quarter of the following parameters:

- pH
- Conductivity
- TDS
- Alkalinity
- Calcium
- Magnesium
- Hardness
- Sodium
- Potassium
- Nitrate
- Chloride
- Sulphate
- Boron
- Iron
- Manganese
- Copper
- Zinc
- E.Coli
- Arsenic
- Lead
- Turbidity

## Excavation of aggregate and backfilling

~~12.10.~~ All excavation and backfilling shall occur in accordance with the certified QBMP.

### Quarry and Backfill Management Plan (QBMP)

~~13.11.~~ At least east one month prior to the commencement of any ~~cleanfilling-quarrying~~ activity, the Consent Holder must prepare a Quarry and Backfill Management Plan (QBMP) in accordance with the resource consent application dated 6 October 2020 and the conditions of this consent, and submit it to the CRC Manager for certification.

**Advice note:** The purpose of the QBMP is to

- identify the best practicable options (BPO) for complying with the conditions of this consent
- provide detail on how the chosen BPO(s) will ensure the conditions of this consent will be complied with; and
- implement those BPO(s).

~~14.12.~~ The exercise of this consent must be undertaken in accordance with the certified QBMP. In the event of any inconsistency between the conditions of this consent and the provisions of the QBMP, then the conditions of this consent must prevail.

~~15.13.~~ The QBMP must include but not be limited to:

- a. A description of the content and purpose of the QBMP;
- b. Details of quarrying operations relevant to the deposition of backfill material;
- c. Details of noise management;
- d. Details of spill management and response to any spills;
- e. The actions to be undertaken to ensure compliance with the conditions of this consent and actions to be undertaken in response to any incident that may adversely affect the environment;
- f. Identifying and providing contact details of the staff member responsible for each action;
- g. The steps to be undertaken to correct incidences of non-compliance with the conditions of this consent;
- h. A description of operational procedures and monitoring that will be implemented to prevent unauthorised material from entering the site;
- i. A list of acceptable and unacceptable backfill materials;
- j. How rejected backfill materials will be stored pending its removal to another site authorised to receive it;
- k. The maximum length of time that rejected material can be stored on site pending its removal;
- l. Construction procedures to ensure the long-term stability of backfilled areas;
- m. Timetable of works and re-vegetation measures;
- n. Procedures for improving and/or reviewing the QBMP; and

~~16.14.~~ The certified QBMP must be reviewed and updated at least once every two years for the duration of this consent.

~~17.15.~~ Any updated version of the QBMP must be forwarded to the CRC Manager for certification within 30 days of its review and updating.

### **Staff Training**

~~18.16.~~ Specific staff training specified in the QBMP must be

- a. provided in accordance with
  - i. Section 8.2.2 of “A Guide to the Management of Cleanfills”, Ministry for the Environment, January 2002; and
  - ii. where relevant, “Technical Guidelines for Disposal to Land (Updated August 2018)”, WasteMINZ, 2018.

~~19.17.~~ Annual refresher training must be provided by a SQEP in backfill management, as part of the training specified in the QBMP.

### **Backfilling**

#### *Acceptance and rejection of backfill material*

~~20.18.~~ Backfill material brought to the site shall be:

- a. accompanied by a description of the material, the source of the material and the name of the company delivering the material;
- b. assessed by the site manager or nominated person against the backfill acceptance criteria;
- c. accepted if determined to be acceptable backfill by the site manager or nominated person; or
- d. rejected if determined by the site manager or nominated person to be
  - i. not acceptable backfill material or
  - ii. contrary to the accompanying description referred to in Condition 18.a.

~~21.19.~~ The site manager or nominated person’s assessment and determination on the material shall be in accordance with the certified QBMP.

~~22.20.~~ For the avoidance of doubt, the assessment and either acceptance or rejection of material must occur before material is deposited into the excavated area or stockpiled.

#### *Accepted material*

~~23.21.~~ Accepted material shall be

- a. deposited in accordance with the procedures contained in the certified QBMP; and
- b. ~~not deposited into water in the excavated area; and~~
- c. otherwise
  - i. stockpiled in volumes not exceeding 23,000 m<sup>3</sup> (Stockpile A) and 11,500 m<sup>3</sup> (Stockpile B) in total, for later deposition in accordance with this condition; or
  - ii. disposed of immediately at another site licenced to receive it.

~~Advice note: Water means groundwater and surface water, including any water ponding~~

#### *Rejected material*

24.22. Rejected material shall be removed from the site and disposed of at another site licenced to receive it within 48 hrs of its arrival.

*Backfilling to prevent exposure of groundwater*

25.23. Should the groundwater water level increase so that the separation is less than one metre between the measured groundwater levels and the current (at that time) ground level within the quarry site, then the Consent Holder must apply backfill to that area within 24-hours of incident, so as to re-establish a one metre separation distance throughout the quarry site.

24. Should groundwater levels rise into the quarry floor during excavation of aggregate or deposition of Virgin Excavated Natural Material, the Consent Holder must notify the CRC Manager within 24 hours.

*Keeping of records*

26.25. Accepted and rejected material shall be recorded in a digital database, with the database record being provided to the CRC Manager upon request, and including as a minimum the following information:

- a. The date of delivery;
- b. The physical address of the source;
- c. A description of the material;
- d. Any laboratory reports pertaining to the composition of the material;
- e. Any authorisation under which the material was removed from the source site (e.g. resource consent);
- f. The weight or volume of the delivered material;
- g. Whether the material was accepted or rejected;
- h. The name of the person assessing and determining whether the material was accepted or rejected;
- i. The reasons the material was accepted or rejected;
- j. A digital, date and location-stamped photograph of the material on the delivery truck in sufficient detail and clarity to confirm the accuracy of the description of the material in Condition 23.c.
- k. Digital video footage that is date and location stamped showing accepted material being placed, in sufficient clarity and detail to confirm the accuracy of the description of the material in Condition 23.c.

**Groundwater Quality Monitoring and Reporting**

27.26. Prior to the commencement of quarry activities, representative samples of groundwater must be taken (subject to landowner approval and if practically possible) from all domestic water supply wells within 500 metres downgradient of the site, as indicated in attached Plan X [Figure 1 of Appendix E] and listed on CRC's wells database, to establish baseline water quality conditions in those wells. Each bore sample must be analysed for the contaminants in Table 1 of Condition 25. A copy of the results of the groundwater samples must be provided to the CRC Manager and the bore owner.

28.27. The Consent Holder must undertake the following groundwater sampling regime for the bores identified in Condition 24 of this Consent:

- a. Representative samples of groundwater must be taken at three-monthly intervals for a period for the duration of this consent after quarry activities commence;
- b. Samples must be taken after adequate purging to remove all stagnant water from the bores or by using an alternative method, such as a low-flow sampling technique, to ensure that fresh groundwater is drawn through the bore screens;
- c. All samples must be taken by a suitably qualified practitioner and analysed for the contaminants listed in Table 1 by an accredited laboratory; and
- d. The water quality monitoring results must be supplied to the CRC Manager within one month of them being received in an electronic format, suitable for automatic upload to a water quality database (preferably directly from the analytical laboratory immediately after quality checking).

Table 1: Parameters.

Parameter
pH
Conductivity
TDS
Alkalinity
Calcium
Magnesium
Hardness
Sodium
Potassium
Nitrate
Chloride
Sulphate
Boron
Iron
Manganese
Copper
Zinc
E.Coli
Arsenic
Lead
Turbidity



## Responses to Monitoring

~~29~~28. The results of the analyses of groundwater samples tested must be compared with the contaminant trigger values in Table 1, that shall be established within the first year of monitoring. After the first year of operations any contaminant concentration in the downgradient bores will be deemed an exceedance if:

- a. The tested result is in excess of the trigger values for a contaminant given in Table 1 and the median concentration of the same contaminant in the upgradient wells for that sampling event is less than the Table 1 trigger values; or
- b. Where any median concentration in the upgradient wells for a sampling event exceeds the Table 1 trigger, the median concentration of a contaminant in the downgradient wells exceeds the upgradient median concentration of the same contaminant by more than 25 percent of the respective Table 1 contaminant trigger value.

**Advice note:** The trigger levels are intended to establish if there has been an increase in concentration of any contaminant across the Consent Holder's site. Upgradient wells are to monitor if any contamination is coming from other upgradient properties. Condition 26.b makes allowance for Table 1 trigger values being exceeded because of an upgradient contamination source, by requiring a further increase of more than 25 percent of the trigger level across the site before a consent exceedance is triggered.

**Advice note:** Median concentrations are intended to combine results spatially from different wells, to account for the potential for narrow plumes of contaminants in groundwater being detected at only one well. Where Condition 26 refers to a median concentration, it is to be calculated from the test results from a set of monitoring wells, (either upgradient or downgradient wells), for one sampling event, not averaged over different events.

~~30~~29. If there is an exceedance in a downgradient bore as determined by Condition 26, the Consent Holder must within one month of receiving the results:

- a. Obtain a second sample of groundwater from the bore sampled in accordance with Condition 25;
- b. Obtain a sample of groundwater from the upgradient bores specified in Condition 24; and
- c. Analyse these samples in accordance with Condition 25.

~~31~~30. If the results of analysis of the second groundwater samples carried out in accordance with Condition 27 show that none of the concentrations of contaminants analysed exceed the trigger concentrations in Condition 25 Table 1 as determined by Condition 26, the Consent Holder must continue to sample groundwater in accordance with Condition 25.

~~32~~31. If the results of analysis of the second groundwater samples carried out in accordance with Condition 27 show an exceedance of the trigger concentrations in Condition 25 Table 1 as determined by Condition 26, the Consent Holder must within 24 hrs of receiving the result:

- a. Notify the CRC Manager within 24 hrs of receiving the result;
- b. Notify the residential occupiers with water supply bores for all adjoining properties 500 metres downgradient of the site boundary affected monitoring bore within 24 hrs of receiving the result;

- c. Sample all domestic wells within 500 metres downgradient of the site boundary and analyse the samples for contaminants listed in Condition 25 Table 1 (subject to well owner approval);
- d. Conduct an investigation into the potential cause(s) of the exceedance, which may include undertaking additional monitoring beyond the routine sampling.

~~33-32.~~ If any domestic bore sample reveals an adverse effect on drinking-water quality which was not present at the time of baseline sampling prior to quarrying operations commencing, including on its taste, clarity or smell, then the Consent Holder must:

- a. provide the well user with
  - i. an alternative supply of potable water,
  - ii. an appropriate water treatment system,
  - iii. a deeper well for the user (subject to the landowner's approval); and
- b. implement necessary measures to reduce the concentration of the contaminant in groundwater such as:
  - i. cessation of activities that may have caused the exceedance;
  - ii. removal of the contaminant source(s);
  - iii. stabilisation or capping of the contaminant source(s); and
  - iv. revision of ~~cleanfill~~ backfill management procedures.

## Annual Report

~~34-33.~~ The Consent Holder must prepare an annual report containing groundwater level and quality monitoring data and assessments required to be collected under the conditions of this consent and a discussion of groundwater quality trends in the monitoring data, any exceedances of the Table 1 contaminant trigger concentrations and any mitigation actions taken in response to those exceedances.

~~35-34.~~ The annual report must be provided to the CRC Manager by 31 August each year.

## Spills

~~36-35.~~ The Consent Holder must prepare a Spill Management Plan (SMP) for the site and provide the SMP to the CRC Manager for certification.

~~37-36.~~ The exercise of this consent must be in accordance with the certified SMP. In the event of any inconsistency between the conditions of this consent and the provisions of the SMP, then the conditions of this consent must prevail.

~~38-37.~~ The SMP must as a minimum:

- a. Contain a description of the content and purpose of the SMP;
- b. Document measures to prevent leaks and avoid spills of fuel or any other hazardous substance (including fuel reconciliations);
- c. Set out procedures to be undertaken in the event of a spill of fuel of any hazardous substance; and
- d. Set out staff training requirements for responding to spills.

~~39~~38. The Consent Holder must take all practicable measures to prevent leaks and avoid spills of fuel or any other hazardous substances in accordance with the SMP including but not limited to:

- a. No refuelling or maintenance of vehicles or machinery can occur on the quarry pit floor;
- b. Appropriate servicing and maintenance of vehicles and machinery such that they do not result in leaks or spills;
- c. Keeping a spill kit capable of absorbing all fuel and oil products on site and available at all times; and
- d. Training all staff involved in the refuelling or maintenance activities in the use of spill kits.

~~40~~39. Mobile tankers must not be present on site outside of refuelling areas and for temporary periods for refuelling purposes.

~~41~~40. In the event of a spill of fuel or any other hazardous substance, the Consent Holder must ensure that:

- a. The spill is cleaned up as soon as practicable and measures taken to prevent a reoccurrence;
- b. Within 24 hours of a spill event exceeding four litres occurring, the CRC Manager is informed and provided with following information:
  - i. The date, time, location and estimated volume of the spill;
  - ii. The cause of the spill;
  - iii. The type of hazardous substance(s) spilled;
  - iv. Clean up actions undertaken;
  - v. Details of the steps taken to control and remediate the effects of the spill on the environment;
  - vi. An assessment of any potential effects on the environment of the spill; and
  - vii. Measures to be undertaken to prevent a reoccurrence of the spill.

### District land use consent

1. Pursuant to section 125 of the Resource Management Act 1991 this consent will lapse five years after the date of this consent unless either the consent is given effect to, or the Council has granted an extension pursuant to section 125(1)(b) of the Act.
2. The term of consent is 15 years.
3. The hours of operation for quarry activities other than monitoring and dust suppression are limited to:
  - a. Monday to Friday excluding public holidays:
    - i. Trucks crossing the racetracks of the Racecourse: 10am – 6 pm
    - ii. All other activities: 7am – 6pm
  - b. Saturday excluding public holidays: 7am – 6pm
4. No quarrying activities other than monitoring and dust suppression shall occur:
  - a. On public holidays; and
  - b. Days with events at Rangiora Racecourse, unless otherwise agreed between the Consent Holder and the Committee of the Rangiora Racecourse;
5. The maximum area of exposed ground shall not exceed 2 hectares at any one time which:
  - a. Includes areas where:
    - i. overburden has been stripped, and
    - ii. gravel has been or is being removed and has not been rehabilitated; and
    - iii. backfill has been placed or is being placed and has not been rehabilitated; and
    - iv. top soil has been placed and has not yet been seeded or otherwise rehabilitated; and
    - v. exposed gravel and other loose surfaces on stockpiles; and
  - b. Excludes:
    - i. unsealed road surfaces within the site associated with this resource consent; and
    - ii. unsealed racetrack surfaces;
    - iii. re-seeded topsoil where grass coverage has not yet been established; and
    - iv. any other unsealed surfaces existing legally at the site at 1 November 2020.

### **Site access – on WDC road reserve**

6. Vehicle access must be provided across WDC road reserve from the pavement of River Road, at or about 330 metres west of West Belt/River Road intersection, and used by all vehicles entering and existing the site.
7. Access must be designed and constructed in general accordance with Plan A [**Error! Reference source not found.**].

8. Prior to the construction of River Road vehicle access enhancements required by condition 7, the Consent Holder shall provide detailed designs of those improvements to Waimakariri District Council's Transportation Asset Manager for technical review and certification.
9. Access arrangements specified in conditions 6,7 and 8 must be constructed and be fully operational prior to the commencement of quarrying operations.

#### Site access and roading – on site

10. The on-site access road shall include:
  - a. a sealed access road for no less than the first 50m from the site boundary vehicle accessway onto/from River Road;
  - b. a truck park-up area adjacent to the sealed access road (condition 10(a)) for the purpose of existing drivers communicating by RT with any incoming (site bound) traffic from River Road; and
  - c. a rumble strip within that 50m of sealed access road (condition 10(a)) to assist in removing dusty and loose material from vehicles before vehicles exit the site.

#### Traffic Management

11. Vehicle movements must not exceed a maximum of 250 per day. For the avoidance of doubt this means no more than 125 trucks or other vehicles entering the site each day and 125 trucks or other vehicles exiting the site each day, and the Consent Holder shall maintain records through declaration forms of truck movements that can be provided upon request by the consent authority.
12. The Consent Holder must take all practicable steps to ensure that heavy vehicles associated with the site operations do not use engine brakes while on River Road and Lehman's Road.

#### Noise

13. All quarrying operations on the site ~~measured in accordance with the provisions of NZS 6801:2008 "Acoustics – Measurement of environmental sound" and assessed in accordance with NZS 6802:2008 "Acoustics – Environmental Noise", must~~ shall not exceed the noise levels in Condition 13a and 13b at the notional boundary of any dwelling within the Rural Zone, or at any point within any Residential Zone:
  - a. Monday to Friday (0700 – 1900 hrs) and Saturday (0700 – 1500 hrs): 50~~1~~ dB L<sub>Aeq</sub>(15 min) ~~at any point within any other property;~~
  - b. At any other time, 40 dB L<sub>Aeq</sub>(15 min) and 70 L<sub>AFmax</sub>;
14. Noise described in Condition 13 shall be:
  - a. measured in accordance with the provisions of NZS 6801:2008 "Acoustics – Measurement of environmental sound"; and
  - a.b. assessed in accordance with NZS 6802:2008 "Acoustics – Environmental Noise".
- 13.15. Site preparation activities must be conducted in accordance with NZS 6803: 1999 "Acoustics Construction Noise" and must comply with the "typical duration" noise limits contained within Table 2 of that Standard.
- 14.16. Should audible vehicle reversing alarms be required on quarry-based equipment or trucks, only broadband noise alarms shall be used.

## Quarry and Backfill Management Plan (Noise Management)

~~15.~~17. The Consent Holder must prepare a Quarry and Backfill Management Plan (QBMP) that shall outline the management approaches for noise, that is to be certified by the WDC Consent Authority.

**Advice note:** The purpose of the noise management section of the QBMP is to:

- identify the best practicable options (BPO) for complying with the conditions of consent relating to noise;
- provide detail on how the conditions of this consent will be complied with; and
- implement those options.

~~16.~~18. As a minimum the noise management within the QBMP must include:

- a. The proposed measures to be used to control noise generated by quarry activities;
- b. The role of the Consent Holder's staff in the management of noise and the nomination of specific staff member(s) responsible for overseeing the implementation and upkeep of the noise matters within the QBMP~~NMP~~; and
- c. The procedures that will be followed by the Consent Holder should any complaint in relation to noise be received.

~~17.~~19. Noise emissions from quarry activities must be measured and assessed in accordance with the noise management methods described in the QBMP by a suitably qualified and experienced acoustic consultant at the following times:

- a. Once within the first 12 months following the commencement of quarrying operations; and
- b. When excavation initially advances to within 200 m of any dwellings.

~~18.~~20. Within 20 working days of measuring noise emissions in accordance with Condition 18, a report describing the measurement results and compliance or otherwise with the limits in condition 13 must be submitted to the WDC Consent Authority.

## Rehabilitation

~~19.~~21. Each stage of aggregate extraction, with the exception of any active haul roads, must be rehabilitated within six months of the completion of clean-backfilling. Rehabilitation must include, but is not limited to:

- a. Reshaping the clean-filled~~backfilled~~ areas; and
- b. Spreading topsoil over the reshaped clean-fill~~backfill~~ to a minimum depth of 300 mm; and
- c. Either
  - i. Sowing the top-soiled areas with a suitable grass species or another suitable vegetative cover; or
  - ii. If rehabilitation occurs outside of spring or autumn, covering the top soiled area with mulch or another form of material to suppress dust from the area until it is appropriate to sow grass or another suitable vegetative cover; and
- d. Undertaking all reasonably practicable measures to prevent dust emissions from the rehabilitated area, including but not limited to watering of exposed soil.

**Advice note:** The Consent Holder may need to monitor the site and water or fertilise the rehabilitated area to ensure compliance with Condition 20.

~~20-22.~~ All rehabilitated surfaces must be designed and constructed to be free draining.

~~21-23.~~ The final rehabilitated ground level must not be above the ground level that existed prior to quarrying operations commencing.

~~22-24.~~ Prior to the expiry of this consent the perimeter bunds are to be removed as part of the rehabilitation works. The edge treatment plantings must remain until grass cover has established over any disturbed land.

### **Accidental Discovery Protocol**

~~23-25.~~ Immediately following the discovery of material suspected to be a taonga, kōiwi or Māori archaeological site, the following steps must be taken:

- a. All work in the vicinity of the discovery must cease and the WDC Manager advised;
- b. Immediate steps must be taken to secure the site to ensure the archaeological material is not further disturbed;
- c. The Consent Holder must notify the Te Ngāi Tūāhuriri Rūnanga and the Area Archaeologist Heritage New Zealand Pouhere Taonga (in the case of kōiwi (human remains) the New Zealand Police must also be notified).

**Advice Note:** The Te Ngāi Tūāhuriri Rūnanga and HNZPT will jointly appoint a qualified archaeologist who will confirm the nature of the accidentally discovered material.

~~24-26.~~ If the material is confirmed as being archaeological, the Consent Holder must ensure that an archaeological assessment is carried out by a qualified archaeologist, and if appropriate, an archaeological authority is obtained from HNZPT before work resumes (as per the Heritage New Zealand Pouhere Taonga Act 2014).

~~25-27.~~ The Consent Holder must consult the Te Ngāi Tūāhuriri Rūnanga on any matters of tikanga (protocol) that are required in relation to the discovery and prior to the commencement of any investigation.

~~26-28.~~ If kōiwi (human remains) are uncovered, in addition to the steps above, the area must be treated with utmost discretion and respect, and the kōiwi dealt with according to both law and tikanga, as guided by the Te Ngāi Tūāhuriri Rūnanga.

~~27-29.~~ Works in the site area must not recommence until authorised by the Te Ngāi Tūāhuriri Rūnanga, the Heritage New Zealand Pouhere Taonga (and the NZ Police in the case of kōiwi) to ensure that all statutory and cultural requirements have been met.

~~28-30.~~ The Consent Holder must notify WDC prior to the recommencement of work, and copies of all relevant authorisations must be provided to the WDC Manager.

**Advice Note:** It is expected that all parties will work towards work recommencing in the shortest possible time frame while ensuring that any archaeological sites discovered are protected until as much information as practicable is gained and a decision regarding their appropriate management is made, including obtaining an archaeological authority under the Heritage New Zealand Pouhere Taonga Act 2014 if necessary. Appropriate management may include recording or removal of archaeological material.

**Advice Note:** Although bound to uphold the requirements of the Protected Objects Act 1975, the Consent Holder recognises the relationship between Ngāi Tahu whānui, including Te Ngāi Tūāhuriri Rūnanga Kaitiaki Rūnanga, and any taonga (Māori artefacts) that may be discovered.

### **Miscellaneous operational conditions**

~~29-31.~~ 31. Solid waste resulting from quarrying operations must be disposed of to an approved solid waste facility by an appropriately licenced operator. Solid waste must be held in wheelie bins or similar appropriate containers designed to avoid attracting birds or rodents, to shelter the contents from rainfall, and to secure the waste in the event of windy conditions.

~~30-32.~~ 32. The only hazardous substances that can be stored on site are fuel and lubricants for quarry plant and machinery.

### **Review condition**

~~31-33.~~ 33. The Waimakariri District Council may, during the month of May or November each year, review any or all of the conditions of the consent pursuant to section 128 of the Resource Management Act 1991 for all or any of the following purposes:

- a. To deal with any adverse effect on the environment which may arise from the exercise of the consent that was not foreseen at the time of granting of the consent, and which is therefore more appropriate to deal with at a later stage; and/or
- b. To require the Consent Holder to adopt the best practicable option to remove, remediate or reduce any adverse effects on the environment resulting from the activity; and/or
- c. To review the noise limits and any adverse effects resulting from heavy vehicle traffic associated with quarry activities, including measures to manage heavy vehicle traffic flows not foreseen at the time of granting of the consent; and/or
- d. To review the methodology of quarry activities should adverse noise, dust or nuisance effects become an issue; and/or
- e. To require consistency with any relevant Regional Plan, District Plan, National Environmental Standard, Water Conservation Order or Act of Parliament.

END