

**BEFORE THE CANTERBURY REGIONAL COUNCIL
AND THE WAIMAKARIRI DISTRICT COUNCIL**

IN THE MATTER OF the Resource Management Act 1991 ('the RMA')

AND Five Resource consent applications by Taggart Earthmoving Limited to establish, maintain and operate an aggregate quarry located at the Rangiora Racecourse, 309 West Belt, Rangiora.

**REPORT AND DECISION OF
HEARING COMMISSIONERS PAUL ROGERS (CHAIR)
AND JOHN ISELI.
FRIDAY 9 JULY 2021**

CONTENTS

1.	INTRODUCTION	3
2.	DECISION OUTCOME.....	3
3.	BACKGROUND	3
4.	THE HEARING.....	11
5.	PRINCIPAL ISSUES IN CONTENTION	12
6.	RELEVANT OBJECTIVES AND POLICIES.....	41
7.	PART 2 MATTERS	46
8.	OTHER RELEVANT MATTERS	46
9.	SECTION 105 MATTERS	46
10.	SECTION 107 MATTERS- RESTRICTIONS ON GRANT OF CERTAIN DISCHARGE PERMITS.....	47
11.	ALTERNATIVE SITES	47
12.	DECISION	49

1. INTRODUCTION

- 1 Paul Rogers (Chair), Reginald Profit and John Iseli were appointed as Independent Hearing Commissioners by both the Canterbury Regional Council (CRC) and the Waimakariri District Council (WDC) under section 34A(1) of the Resource Management Act 1991 (RMA) to decide multiple resource consent applications by Taggart Earthmoving Ltd (the Applicant).
- 2 The multiple resource consent applications to both councils relate to a single proposal, namely to establish, maintain and operate an aggregate extraction quarry located at the Rangiora Racecourse, 309 West Belt, Rangiora (the site).
- 3 When the hearing commenced Reginald Profit retired from the panel due to the late identification of a potential conflict. After hearing from participants present, we determined to proceed with the hearing.
- 4 Prior to the hearing we were provided with a comprehensive application prepared by the Applicant. We have read and considered all of the details within that application. We were also provided with access to submissions lodged in response to the notification of the quarry application. We have considered those submissions.
- 5 Also prior to the hearing a comprehensive section 42A report prepared by Adele Dawson was circulated. As we detail below that report was supported by seven specialist reports. We read and considered that report prior to the hearing. We refer to those reports later in our decision.
- 6 The section 42A report discussed submissions received. There were some 404 submissions received: 394 opposed with nine in support and a significant number of submitters were heard.
- 7 Because of the high number of submissions and because of our approach of concentrating on the critical issues, it is neither practical nor required that we respond to every issue raised in the written submissions within this decision. We do note that the section 42A report usefully summarised matters raised in submissions to include matters concerning air quality, noise, transportation, amenity effects, flooding, water quality, property values, alternative sites, equine safety, racecourse operations, and preclusion of alternate development, positive effects and finally adequacy of information. We comment on most but not all of those matters in our decision.

2. DECISION OUTCOME

- 8 For the reasons detailed within this decision we have decided to decline the applications.

3. BACKGROUND

- 9 Relevant background matters include:
 - (a) Description of the Proposal;
 - (b) Preliminary matters –other resource consents required -significance;
 - (c) The Resource Consent Applications;
 - (d) Existing Environment;

SJG-038023-127-49-V6

SJG-038023-127-49-V2

(e) Site Visit;

(a) Description of the Proposal

- 10 A full description of the activities to establish, maintain, operate and rehabilitate the quarry has been provided in the Assessment of Effects, Section 2 (pages 2-25) and within the Appendices attached to the resource consent applications.
- 11 Within her Section 42A report, Adele Dawson, provided a detailed description of the proposal at paragraphs 69 to 122 inclusive.
- 12 We adopt both descriptions for the purposes of this decision. However, to provide some context in this decision we record the proposal involved a range of site preparation activities including the construction of acoustic bunds at least 3m in height with a 1m wide top and a base between 7 to 15m in width. Access roads would be upgraded, sealing of the site entrance, (later amended to include the entire site entrance road), installation of perimeter fencing, and installation of groundwater monitoring bores and air quality monitoring equipment were included in the proposal.
- 13 A limited number of particularly described vehicles would undertake the excavation and remediation activities. Those vehicles included a motor scraper limited to 3.5 hours use per day, one large hydraulic excavator, one front-end loader, truck and trailer units to transport excavated material and import clean fill and finally a water cart for dust suppression.
- 14 An important part of the proposal was that there would be no gravel crushing or breaking activity on the site nor would there be any drilling or blasting activities. All gravel materials would be taken to the Applicant's Cones Road depot for processing. Cones Road depot is approximately 1.4km along River Road from the application site.
- 15 A maximum of 685,900m³ of gravel would be removed. The maximum depth of excavation is proposed to be no more than 5m below ground level. The Applicant would respond to varying ground water level depths by maintaining at least 1 m separation to groundwater. The total quarrying area is 14.5ha. Excavation was planned to occur over 8 stages with each stage being no more than 2ha in area. The maximum extraction rate per day was proposed to be 2000 tons with no annual extraction limit.
- 16 It was intended there be two stockpiles on site. Stockpile A was proposed to be up to 23,000m³ and would contain stripped overburden and topsoil to be used for rehabilitation, and also imported clean fill material. The Applicant could access this stockpile in order to backfill the excavated pit. Stockpile B was intended to be approximately 11,500m³ and comprise of extracted aggregate which could be removed from the site when access across the racetrack to the extraction area is restricted. Stockpile B would be available to be used as backfill in the event of rising groundwater.
- 17 The aggregate and virgin extracted natural materials (VENM) stockpiles would be limited to 5m in height.
- 18 Access to the site will be from River Road, a sealed road. Access into the site from River Road was to be upgraded in order to comply with the district plan access standards. As noted earlier it was proposed the entire access road, 540 metres in

length, within the site would be sealed with surface bitumen material milled from existing sealed roads.

- 19 All vehicle movements on and off-site will be restricted to 250 movements per day.
- 20 Mitigation measures to prevent or minimise noise effects include acoustic bunds at the western and eastern boundaries of the quarry and restricting the use of the motor scraper to some 3.5 hours per day. Proposed consent conditions were advanced to deal with and address noise effects.
- 21 Backfilling to rehabilitate the site would take place by depositing backfill VENM and re-spreading of stockpiled topsoil. Backfill material will be clean fill and meet the definition of class V clean fill material as developed by WasteMINZ. This material will contain only natural materials such as rock, clay, gravel and soil from uncontaminated sites. It should therefore not contain any hazardous or leachable components. Other than clean fill, the only other material used during rehabilitation will be the excavated material stockpiled on site.
- 22 The volume of clean fill required for rehabilitation corresponds with the volumes of materials extracted, determined by the depth of excavation relative to groundwater levels.
- 23 The Applicant proposed a number of measures to ensure that the clean fill materials meet the class V criteria. Those measures included matters such as not accepting material from any site that falls within the hazardous activities and industrial list, consented contaminated site or suspected contaminated site unless there is sufficient evidence to demonstrate acceptability. There would be visual inspection of individual truckloads. As well, site inspections and digital photographs with time and date stamps would be taken of each load and where it is placed, auditing of the clean fill would occur at the rate of one per 5000m³ to determine if load descriptions are consistent with load documentation and to identify any unusual characteristics such as smell or colour, and verification sampling of backfill material would occur at least twice for every 10,000m³. It was proposed that this work would be completed by a suitably qualified and experienced practitioner and the samples would be analysed for a number of contaminant indicators.
- 24 The proposal provided that acceptable clean fill would be deposited no less than 1 m above ground water. There was not to be any deposition into water in the pit and surveillance footage of backfilling would be undertaken.
- 25 The hours of operation are anticipated to be 7am to 6pm Monday to Friday and 7am to 3pm on Saturdays. No work was proposed on Sundays or public holidays.
- 26 The racecourse was intended to continue to operate during the life of the quarry. In general gravel extraction would only occur between 10am and 5pm. We were told course members train horses in the mornings until 10am. Therefore, extraction from inside the track will occur after 10am. However, carting from stockpile areas could commence from 7am.
- 27 The proposal provided a range of dust mitigation and monitoring measures. The monitoring included both visual and instrument monitoring.
- 28 Water for dust suppression will be sourced from the racecourse bore M35/9270 under consent CRC 160231. An assessment of the water demand for dust suppression was provided to demonstrate there will be sufficient water available for use under that existing consent.

29 Groundwater level monitoring was proposed because a limit on excavation depths no deeper than 1m above real-time groundwater levels was part of the proposed activity. It was proposed to connect the monitoring of groundwater to an automatic alert system that would send a message to the site operation manager at 24-hour intervals. It was also proposed that all members of the operation team would have access to that same real-time data.

30 Monitoring of groundwater quality was also proposed. There were measures proposed in relation to fuel spills, refuelling and hazardous substances along with an accidental discovery protocol. Finally, a Quarry and Backfill Management Plan (QBMP) was proposed. Additionally, there were a range of resource consent conditions included as part of the applications.

(b) Preliminary Matters –Other Resource Consents Required –Significance

31 We were informed that additional consents were likely to be required to fully authorise the proposed activities described above. Three additional resource consents were likely to be required.

32 These included a variation to the existing discharge permit that authorises discharge of particulate matter to air associated with the Applicant's Cones Road aggregate processing site, a variation to the existing water permit held by the racing club (CRC 160231) to authorise the use of water for dust suppression outside of the racetrack ovals, and finally a discharge permit to discharge stormwater from the access road on the assumption this activity could not be incorporated into the current discharge permit.

33 Adele Dawson in her section 42A report at paragraphs 39 to 50 addressed the additional resource consent issues. While we did hold concerns about overlapping or cumulative effect issues arising from these additional consents, for example relating to the potential for contamination to exacerbate groundwater and dust risks associated with the proposal, overall, we considered her approach to the additional resource consent issue was appropriate. We also held some reservations that the need for these additional consents demonstrated that the applicant may not have been fully focused on identifying and assessing effects when preparing the applications.

34 In any event if we were minded to grant consent then this condition precedent type approach would need be utilised. However, given the decision we have reached we do not need to address the issue further.

(c) The Resource Consent Applications –Details and Bundling

35 The resource consent applications are fully described within the application and within the section 42A report. We adopt those descriptions.

36 Adele Dawson the section 42A reporting officer between paragraphs 123 and 189 of her report identified the legal and planning matters relevant to this proposal. In particular she referred us to sections 9, 14 and 15 of the RMA.

37 Adele Dawson referred us to the Resource Management National Environmental Standards for Air quality Regulations 2004 (NESAQ). She concluded based on the review of the air quality assessment of effects undertaken by Mr Chilton, an air quality specialist, because it is unlikely that discharges from the site would increase the concentrations of PM₁₀ beyond the limit specified in the regulations,

that we were not directed to decline the resource consent in accordance with regulation 17. We accept that advice.

- 38 Adel Dawson also referred us to the Resource Management National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (NES contaminated land), advising she considered the proposed disturbance and redistribution of stockpiled soil is an activity that is regulated and that the land is subject to the provisions of the NES because a Hail Activity had taken place on the site.
- 39 Adele Dawson further noted that if the volumes of disturbance to construct the access road or the volume of stockpiled soil exceeds permitted levels then that part of the activity would be discretionary in accordance with Regulation 11, unless the Applicant undertakes a detailed site investigation of those areas, in which case a controlled activity or stricter discretionary activity consent would be required. We accept that advice.
- 40 Adele Dawson identified the three operative Regional Plans relevant to the Waimakariri District being the Canterbury Land and Water Regional Plan (CLWRP), the Waimakariri River Regional Plan (WRRP) and the Canterbury Air Regional Plan (CARP). She detailed for us which parts of the proposal triggered rules within those regional plans and summarised those rules in Table 4 of her report, which we adopt.
- 41 In relation to the Waimakariri District Plan she undertook a similar process identifying for us within Tables 5,6 and 7 of her report the relevant rules triggered by the proposal. We adopt the same.
- 42 However, for the sake of providing some context we record the applications for consent to CRC and WDC respectively as follows.
- (a) CRC 204106- A land use consent to excavate material;
 - (b) CRC 204107- A discharge permit to discharge contaminants into air from industrial or trade premise or process;
 - (c) CRC 204143-A discharge permit to discharge contaminants to land from backfilling with virgin excavated natural materials;
 - (d) CRC 211629- A water permit to divert flood water;
 - (e) RC 205104- A land use consent to establish, maintain and operate an aggregate quarry in the rural zone.
- 43 A resource consent duration of 15 years was sought for all of the resource consents.
- 44 We have adopted a Bundling approach to all of the resource consents applied for. We considered that one activity is being proposed. All of the activities that require consent are inextricably linked. We have followed the approach of bundling, utilising the most restrictive activity status that applies to the entire proposal.
- 45 We adopted and applied a discretionary activity status to the proposal. Status of the activity as fully discretionary was also agreed between the Applicant and the Section 42A officer.
- 46 We note that these resource consent applications have a relatively long history. They were initially lodged with the consent authorities in late October 2018. The applications were returned to the Applicant because responses for further

information requests were not complied with. New applications were lodged in early 2020 with the applications formally being accepted mid-year in 2020 moving through to notification in the third quarter of 2020.

(d) Existing Environment

47 Both the Applicant and Adele Dawson provided a detailed description of the site and the surrounding environment within the assessment of effects and section 42A report.

The Site

48 To provide some context for this decision, we record the site is used as a racecourse which incorporates an inner and outer track, large grassed areas, and a concentration of buildings on the southern boundary. The buildings on site include stables, grandstand, a dwelling and several accessory buildings. The main access point to the racecourse is off Lehman's Road with an additional access from West Belt Road.

49 As well as the horseracing community organisations utilise the site. Notably a farmers' market has been granted consent to operate on Sundays and one Saturday per year.

50 The site is zoned in the Waimakariri District Plan as Rural. There are two features that across the north-western portion of the site being the 55dBaLdn outer control boundary noise contour lines and the take off and approach obstacle limitation surface around the Rangiora Airfield. Transpower high voltage lines run north-East to South-West to the East of the site.

51 To the south and east of the site is residential zoned land, to the north is the Ashley River and to the west is rural zoned land including a mix of smallholdings, a holiday park and storage facility. Further to the north-west is the Rangiora airport.

52 The Applicant's existing gravel processing site is located approximately 1.3 km east along River Road at Cones Road.

Possible Contamination

53 Ms Iles a specialist section 42A reporter noted that the site is listed on CRC's Land Use Register, being categorised as at or below background concentrations. Ms Iles further reported that there are possible areas of fill material and some soil stockpiles on site that raised questions about potential soil contamination in localised areas on the site.

Road Network

54 Roads surrounding the site are River Road, West Belt and Lehmans Road. River Road is a collector Road, Lehmans Road and West Belt Road are local roads. The route from Oxford Road, down Lehman's Road is signposted as a heavy vehicle bypass.

55 Traffic count data details that the morning peak is between 8am to 9am with an afternoon peak between 5pm to 6pm. For heavy vehicles specifically, the morning peak is commonly between 10-11am and the afternoon peak is between 1-3pm.

56 River Road and Lehmans Road are used by cyclists and pedestrians due to the presence of a well-worn track on the side of the road. There is no formal provision for cycle lanes or footpaths.

Groundwater

- 57 Groundwater flows generally from the NE towards the SE of the site as demonstrated by piezometric contours. Groundwater depth varies seasonally with highest levels typically recorded in August and September. The applicant assessed that typical groundwater levels are 3-3.5 metres below ground level across the north of the site and 4-4.5 metres across the east of the site.
- 58 Ms Kreleger, a specialist section 42A reporter, assessed how quickly groundwater levels may rise. Typically, on a monthly basis, groundwater rises between 0.13 metres and 0.2 metres per day, but she noted that levels can increase more rapidly than this. Ms Kreleger provided a number of examples where groundwater levels have risen more than 1 metre over 2-3 days. It is estimated that this could occur as frequently as once per year.
- 59 Groundwater quality in the area is generally good due to recharge from the Ashley River/Rakahuri. However, local discharges may be having some effect on water quality and some elevated or high concentrations of *E.coli*, iron, manganese, nitrate nitrogen and turbidity have been recorded.
- 60 According to the CRC Wells database there are 21 existing private bores within 1km down-gradient of the site. Of these bores, 12 are listed as being used for domestic supply. Six bores are listed as not being used but were considered in the assessment. The section 42A report notes that the site is located within the community drinking water supply protection zone of bores M35/5069, M35/0325, M35/0216, and M35/6031, cross-gradient of M35/4899 and M35/4898 and also up-gradient of M35/0217, M35/0252 and M35/0249.

Surface water

- 61 The nearest downgradient springs are located east of Rangiora at 3.5 km from the site. The site is located in the catchment of the Ashley River. Shallow groundwater beneath the site originates as seepage from the river and generally flows in a south-easterly direction.
- 62 The western extent of the catchment for Taranaki Stream is located about 2 km downgradient of the site, but drains feeding into the stream start at about 4 km downgradient of the site. The nearest downgradient wetlands are in the upper reaches of the Northbrook Stream, on the south-east of Rangiora, more than 3.5 km away from the site.

Climate

- 63 The site is located outside of the gazetted Rangiora Air Shed which is classed as a polluted air shed under the NESAQ. Exceedances of air quality standards in Rangiora typically occur over the winter period with home heating being the primary pollution source.
- 64 Potential local dust sources include the Ashley riverbed which is nearby and the Applicant's processing site at Cones Road, other rural land uses and the racecourse track.
- 65 The section 42A report provided details on rainfall data, wind speeds and directions which we adopt. The main issue in relation to wind speeds and directions that arose, was whether or not the data collected from the Rangiora airfield was appropriately representative for the site. We return to this matter when discussing dust effects.

Sensitive receptors

- 66 Sensitive residential properties lie to the west, south and east of the site. A number of residential properties along Lehmans Road have boundaries approximately 20-30m from the proposed western bund to be constructed and located on the site.

Existing noise levels and sources

- 67 The primary sources of noise relative to the site were identified as existing road traffic, heavy vehicle movements, light aircraft overhead and natural sounds such as birds.

Flood hazards

- 68 The Ashley River is located approximately 500 m north of the site. The Ashley River control scheme is established and manages flood risks. That scheme involves a network of stop banks, groynes, tree planting and rock protection.

Cultural

- 69 The site is located within the takiwa of Te Ngai Tuahuriri Runanga. There are no known archaeological sites, waahi tapu sites or other sites of significance to Ngai Tahu located at the site.

(e) Site Visit

- 70 Following the Applicant's opening and presentation by Mr Taggart of his evidence we undertook a site visit. We were met at the racecourse site by a member of the racecourse committee who escorted us over that site.
- 71 We examined the site access way and proposed internal access road. We viewed existing stockpiles of material and located the intended position of the acoustic bunds. We identified the crossing point and identified gravel extraction areas as well as the different racetracks and better understood their use.
- 72 We drove the local roading network. We identified recreational areas, utilised by walkers and cyclists. We visited the Cones Road site. We saw, among other things, a sample of milled bitumen materials intended to be utilised to seal the surface of the internal site access road, stockpiles of various materials and the residential properties adjacent the Cones Road site.
- 73 We visited the residential areas surrounding the site in particular noting distances from the quarry site to those areas and paying attention to matters such as views from those residential areas to the quarry site. We identified the location of the Environment Canterbury land, to the east of the site and the possible ground water monitoring sites. We identified some existing groundwater monitoring bores on the site.
- 74 We identified the location of the proposed new road intended to be located over part of, or close to, the Environment Canterbury land.
- 75 We visited the Rangiora Eco Holiday Park camping ground located at 337 Lehmans Road. We also considered the location of the acoustic bund proposed adjacent to the camping ground. While on the site we endeavoured to acquaint ourselves with possible diversion of floodwaters caused by the intended location of the acoustic bunds.

4. THE HEARING

- 76 The hearing took place between Tuesday 4 May through to Tuesday 12 May.
- 77 For the Applicant we heard from:
- (a) Monique Thomas, who provided legal submissions in opening;
 - (b) Paul Taggart, addressing demand for aggregates and Canterbury and North Canterbury, alternative sites, the Taggart business operations and the key features of the proposal;
 - (c) Matthew Noon, addressing in the roading environment, traffic generation, road safety and site access matters;
 - (d) Benjamin Throssell, detailing flood modelling work and flood assessment issues;
 - (e) Jeffrey Bluett, addressing dust generating activities, potential dust impacts and dust mitigation and monitoring;
 - (f) Jon Farren, addressing noise and vibration effects arising from the proposal and mitigation measures;
 - (g) Tracy Singson, addressing backfilling processes and the VENM quality assurance acceptance and screening process;
 - (h) Neil Thomas, addressing groundwater issues;
 - (i) Michael Durand, addressing planning issues.
- 78 Submitters who appeared were:
- (a) John Mather
 - (b) Heather Mather
 - (c) Sue Johnson
 - (d) Wayne Mulqueen
 - (e) Richard Laloli
 - (f) Chris Revell
 - (g) Michael Dickson
 - (h) The Rangiora Ashley Community Board – Andrew Schulte, legal submissions- Jim Gerard, Board Chair – Donovan Van Kekem, air quality expert
 - (i) David Patrick
 - (j) Robyn Lynley-Ann Mauger
 - (k) Ian McCracken
 - (l) Erin Crawford
 - (m) Rex Winks
 - (n) Peter Barber and Marie Barber
 - (o) Pat Myers
 - (p) Julie Lamplugh
 - (q) Claire Chatterton
 - (r) Lynne and Bill Spence

- (s) Kathleen Campbell
- (t) Nikki McKay
- (u) Diane and Chris Wallace
- (v) Jill Robinson
- (w) Ryman healthcare Ltd – Nicola de Witt, legal submissions, Matthew Brown- NZ Development Manager
- (x) Edward Benton
- (y) Marilyn Benton
- (z) Drusilla Kingi-Patterson
- (aa) Marlene Helsen
- (bb) Marilyn Davison
- (cc) Phil Davison
- (dd) John McPhail
- (ee) John Horan
- (ff) Bronwyn Downes
- (gg) Phil Downes
- (hh) Michael Cornwall
- (ii) Geoff Brown - owner of Eco Holiday Park
- (jj) Wendy Withell
- (kk) Mr Withell.

79 The section 42A officers who appeared were:

- (a) Adele Dawson – Principal Planning Officer
- (b) Richard Chilton – Air Quality Scientist
- (c) Amber Kreleger – Groundwater Quality Scientist
- (d) Samantha Iles – Contaminated Land Scientist
- (e) William Reeve –Acoustic expert
- (f) Kalley Simpson - WDC Three Waters Manager
- (g) Chris Morahan - Transportation Engineer

80 Prior to and during the hearing, caucusing between experts was undertaken. We received a number of joint witness statements from the experts as the hearing progressed. We have taken those joint witness statements into account.

81 The hearing was recorded. We have utilised the recording to check our hearing notes and also to generally assist in our deliberations.

5. PRINCIPAL ISSUES IN CONTENTION

82 Utilising the framework provided by section 104 and 104B RMA which we reference below where relevant to our considerations, we now address the principal issues in contention.

- 83 We do so by considering any actual and potential effects on the environment of allowing the activity, application of the permitted baseline, the relevant provisions of relevant planning instruments, any other relevant matters, and finally Part 2 of the RMA.
- 84 We note again in this part of our decision that we had the benefit of expert witness caucusing and the results of the same along with a range of expert joint witness statements that were presented during the hearing in relation to many of the effects we detail below.
- 85 We also record we received presented evidence and submissions from a range of lay submitters, some of which was detailed and had involved a considerable amount of research into the potential effects of the proposal. It is not possible nor necessary to traverse that evidence in detail. However, we do note it has all been carefully considered and taken into account in reaching our overall decision.

Application of the Permitted Baseline

- 86 We can quickly dispose of this matter. We agree with Ms Dawson that none of the activities permitted in the rural zone, within the Waimakariri District Plan, on the site, would be sufficiently similar in character, scale or effect to the proposed quarry to warrant applying a permitted baseline in considering the effects of this proposal.

Actual and Potential Effects

- 87 The principal effects issues in contention, ranked in significance in terms of our decision, were the extent of:
- (a) actual and potential effects on groundwater quality and on groundwater users;
 - (b) actual and potential nuisance and health effects arising from the discharge of particulate matter(dust);
 - (c) actual and potential transportation effects;
 - (d) actual and potential noise and vibration effects;
 - (e) actual and potential landscape, rural character and visual effects;
 - (f) actual and potential effect of the diversion of floodwater;
 - (g) actual and potential effects on surface water quality and ecosystems
 - (h) actual and potential effects on soil and soil resources;
 - (i) actual potential effects on electricity infrastructure;
 - (j) actual and potential effects on Ngai Tahu cultural values; and
 - (k) positive effects.

Actual and Potential Effects on Groundwater Quality and on Groundwater Users

The Proposed Method of Excavation

- 88 The Applicant proposes to excavate to a depth of 5m below ground level. Backfilling with Virgin Excavated Natural Material (VENM) would occur with the aim of maintaining a 1m separation distance between the surface of the filled material and groundwater at all times.

- 89 The proposal represents a significant difference from other gravel quarrying consents granted in the Canterbury Region that typically require that a 1m separation be maintained between the base of the quarry excavation and highest recorded groundwater levels.
- 90 Excavation below highest groundwater levels results in increased risk of contamination with potential effects on groundwater that have been assessed in the application. Given the sensitivity of the shallow groundwater resource downgradient of the site, this is a key issue requiring our consideration.
- 91 In evaluating this issue, we have reviewed a substantial amount of evidence presented by the experts and also the detailed information provided in submissions.

The Existing Groundwater Environment - Sensitivity

Groundwater Levels and Rate of Change

- 92 The groundwater level beneath the site and the rate of change of groundwater level are important considerations because they influence the ability of the Applicant to maintain the proposed 1m separation between excavation and groundwater and also the degree to which deposited material would be saturated with groundwater.
- 93 We heard from the experts that only limited information is currently available relating to groundwater levels below the site and the rate of groundwater rise in response to rainfall and recharge from the Ashley River.
- 94 If consent is granted, the Applicant proposes to monitor groundwater below the site for a period of one year prior to commencement of excavation. We note that a considerable period of time has elapsed since the applications were originally lodged and rejected. Such monitoring could have been undertaken during that period and would have better informed the assessment.
- 95 There remains a degree of disagreement between the experts, Mr Thomas and Ms Kreleger, regarding likely groundwater levels beneath the site. Mr Thomas used monthly water level monitoring data from Bore M35/0142 to inform his assessment of groundwater levels. However, Ms Kreleger points out that highest groundwater levels can be missed using monthly data. Consequently, she preferred the use of daily water level monitoring data from bores located further from the site. These data indicate average groundwater levels of 2.9-4.2m and highest levels of 1.4-2.4m below ground level at the site. Mr Thomas estimates that at times when groundwater levels are highest, groundwater could be within 1.25m and 4mm of the ground surface (paragraph 4.27 of his evidence in chief).
- 96 We prefer the evidence of Ms Kreleger in relation to groundwater levels but note that the experts agree that 12 months of baseline monitoring is necessary to accurately characterise groundwater conditions beneath the site.
- 97 In supplementary evidence Mr Thomas noted that standpipes installed at the eastern end of the site in April 2021 indicated groundwater levels at greater than 6m below the surface at that time. However, we note that logging of water levels occurred for only a limited period of time when seasonal groundwater levels are expected to be at their lowest.
- 98 Mr Thomas estimates that the maximum rate of groundwater level rise based on the continuous record from bore M35/2679 appears to be up to around 1.5m/day. However, he notes (paragraph 4.30 of his evidence in chief) that this maximum

rate of rise was due to extreme weather events on 21–22 July 2017 and 20–21 February 2018 (Cyclone Gita).

- 99 Mr Thomas stated that, based on the data from bore M35/2679, a daily rise of more than 0.5 m occurs less than 1% of the time (based on a dataset from 1983 to 2020) and a groundwater level rise of around 0.1 to 0.2 m is more typical (occurs >95% of the time). He considered that the large rises due to extreme weather events are generally forecast well in advance, allowing quarry operations to be planned accordingly.
- 100 In closing for the Applicant Ms Thomas provided new information regarding recent water level monitoring in bores installed at the site. She stated that Mr Thomas has collected data from those bores which shows the rate of groundwater level rise during the recent heavy rainfall (over the period 29 May 2021 to 1 June 2021).
- 101 That information indicates that over that period, groundwater rose approximately 1.3m over 5 days. She noted that the heavy rainfall weather event was forecast by MetService at least 4 days in advance as a Red Warning. We are aware that the parties have not had opportunity to comment on this new information and also that it relates to a single rainfall event.
- 102 We determine that it is appropriate to have regard to long-term data records to establish likely rates of water level rise.
- 103 The long-term data analysed by Ms Kreleger also indicate that groundwater levels can change quickly in the local area. She considered that it is probable that a rise of more than 1m over two days can occur once per year. Rapid groundwater rise of this nature has consequences for the management of the site in terms of having sufficient backfill material and machinery available to prevent groundwater being exposed.

Groundwater Flow Direction and Affected Water Supplies

- 104 The experts agree that groundwater beneath the site flows generally from the northwest towards the southeast. However, it is also noted that there is variability in both the flow direction and the rate of groundwater flow, with potential for preferred flow channels to exist.
- 105 Numerous shallow bores that are used for drinking water supply have been identified downgradient of the site.
- 106 The nearest downgradient community drinking water supply bores are owned by Waimakariri District Council (WDC) and are listed in Table 3 of Ms Kreleger's evidence in chief. These bores are M35/0325, 10m deep and 425 m from the site (one of the Western Wells), M35/0216, 8.8m deep and 1450m from the site and M35/0217, 13.7m deep and 1480m from the site (the Ayers Street Wells).
- 107 These three community drinking water supply bores are part of the Rangiora Supply Scheme and have community supply drinking water protection zones (DWPZ). Ms Kreleger noted that the Racecourse Site is fully covered by the DWPZ of M35/0216 and partially covered by the DWPZ of M35/0325.
- 108 Mr Simpson explained that M35/0216, M35/0217 and M35/0325 are used as 'backup bores' for the Rangiora water supply. He confirmed that the Western Wells pipeline is currently capped but that this source is maintained so it could be used at short notice. While the various backup bores are not routinely in use, they are kept ready to operate at any time as part of the contingency plans for the

Rangiora water supply and they are included within the Water Safety Plan for the Rangiora Supply Scheme.

- 109 Currently these bores are maintained to provide water in the event that the supply from deep wells in Kaiapoi is adversely affected. Mr Simpson noted that long term strategies for the Rangiora Supply Scheme could change and these bores could become a primary source in the future in order to either accommodate future growth on the scheme or improve the scheme's resilience.
- 110 We accept the evidence that potential effects on the groundwater supply to these bores should be considered on the basis that they are maintained for community supply and could be used for that purpose in future.
- 111 Numerous shallow domestic supply bores have also been identified down-gradient of the site. Bores within 1km down-gradient of the site have been detailed by Ms Kreleger (paragraph 70 of her evidence in chief). In the reply in closing, Ms Thomas discussed further correspondence with Mr Simpson that indicates that all properties within 1000m downgradient of the site may now be connected to the reticulated water supply.
- 112 This is new information. We have not heard from Mr Simpson directly and we are aware that the parties have not had opportunity to comment on this information. It is not sufficiently clear if all of those properties have now chosen to connect to the available reticulated supply and no longer use their domestic supply bores. Visits to the affected properties by the Applicant, prior to the hearing, would have provided greater clarity on this matter.
- 113 However, we have decided not to seek further information on this matter because, given our conclusions regarding potential effects on community supplies, that information is not necessary to reach a decision.
- 114 The experts and submitters agree that the local groundwater supply is highly sensitive to any risk of contamination.

Groundwater Level Monitoring to Develop a Forecasting Model

- 115 The Applicant has proposed that, if consent is granted, several water level monitoring bores will be established at the site. These bores would be used to provide accurate information on the depth and rate of change of groundwater levels that would allow a forecasting model to be developed. The model could then be used to inform site management procedures in terms of depth of quarrying and backfilling methodology.
- 116 In her Reply Ms Thomas at paragraph 76(b) recorded Mr Thomas's view that development of the forecasting model would be straightforward. That view was not shared by the experts. Moreover, given the critical importance of the model we were surprised that a fully developed forecasting model was not presented. If a developed model were presented, we consider that may have had a beneficial impact on our considerations.
- 117 Ms Kreleger considered that development of an accurate water level forecasting model is key with respect to managing the proposed operation and reducing risks to groundwater. In response to questioning, both Ms Kreleger and Dr Rutter considered that this information should be available prior to granting any consent, in order to inform an adequate assessment of effects of the proposal and determine if the proposed management measures are practically feasible.

- 118 Several submitters and officers raised concerns regarding the adequacy of the proposed quantity of backfill material available onsite to enable rapid response to rising groundwater levels. Mr Simpson and Ms Kreleger calculated that a large number of truck movements per hour could be required to respond to an “emergency” backfilling scenario associated with rapidly rising groundwater and considered that the necessary response may not be practically achievable. Mr Simpson concluded (paragraph 30 of his summary statement) that the backfill management procedures proposed are not adequate, and potentially not practical, to ensure that the groundwater level at the site does not rise above the excavation level.
- 119 In the Applicant’s reply, Ms Thomas stated that, depending on the amount of rain forecast, the Applicant has additional plant available that can be brought to the site at very short notice to move backfill instead of using a motor scraper. Ms Thomas confirmed the Applicant’s view that the proposed 30,000m³ of backfill material to be stored at the site could be moved within the proposed operating hours.
- 120 The evidence is that maintaining 1m separation from groundwater is critical to controlling contamination risks associated with the proposal. However, we are not satisfied that the Applicant has provided sufficient information to adequately demonstrate that this could be practically achieved.
- 121 Detailed management procedures would be necessary, informed by a forecasting model that has been presented and reviewed as part of the assessment process. Even in those circumstances, we find that the complexity and practical issues associated with monitoring and site management would pose a risk that groundwater could be exposed at the surface at this location.

Risks to Groundwater

Risks Associated with Hydrocarbon Spills

- 122 Mr Thomas modelled the potential effect of a hydrocarbon spill scenario. His assessment assumed a 300-litre hydrocarbon spill with no clean-up at source. For this scenario, Mr Thomas estimated a potential travel distance of 150m to 175m, depending on the porosity value selected, where predicted benzene concentrations exceed the maximum acceptable value (MAV) for drinking water.
- 123 Ms Kreleger considered that the fuel spill modelling is appropriately conservative and considered that exceedance of drinking water guidelines is unlikely to occur beyond 175m from the source. However, she noted in response to questioning that the modelling does not take into account the effect of contaminant movement in preferred flow channels, should they be encountered.
- 124 We accept the evidence that measures can be imposed to minimise the likelihood of fuel or oil spills and that the effects of any such spills, should they occur, are not likely to extend to the location of downgradient drinking water supplies.

Risks Associated with Faecal Contamination of Groundwater

- 125 Mr Thomas also modelled a faecal contamination scenario, most likely to be associated with the presence of bird life in standing groundwater at the site. He noted that bacterial contamination could potentially occur should emergent groundwater pond at the ground surface, or because of stripping of the overburden that currently overlies and protects groundwater in the area. He predicted that *E. coli* contamination of groundwater could extend approximately 150m downgradient of the source at concentrations that exceed the drinking water standard.

- 126 The experts were not able to agree regarding the extent of potential microbiological contamination of groundwater that may occur. Ms Kreleger and Dr Rutter observed that the parameters used for the modelling presented by Mr Thomas were not conservative and that microbial contamination could extend considerably further from the site.
- 127 Ms Kreleger explained that the regional council prefers to use a one-year time of travel for the protection of community drinking water supply bores. The travel time criterion is intended to disrupt the potential pathway from a microbial contaminant source to the point of abstraction by allowing sufficient time for removal or die-off of pathogenic microorganisms through the vadose zone and aquifer.
- 128 Ms Kreleger stated that in alluvial gravel aquifers in Canterbury, a one-year travel time may equate to large distances. She noted that where there is large uncertainty over the travel distances, the regional council recommends using a maximum distance of 2.5km up gradient of the drinking water source. Ms Kreleger considered that there is a risk that contamination by pathogenic microorganisms in the excavated pit could travel further than 150m. She referred to the extensive experience of Dr Rutter in this field and supported her technical assessment.
- 129 Dr Rutter considered that, even at smaller source concentrations than those modelled by Mr Thomas, predicted *E. coli* concentrations in groundwater could exceed the drinking water standard for 1000m downgradient of the source. Dr Rutter noted that her modelling approach is commonly applied and has been peer reviewed. She further noted that Mr Thomas did not undertake a sensitivity analysis of the microbial modelling. Overall, Dr Rutter considered that the risk of microbial contamination is “fairly low” but that the consequences would be high.
- 130 We prefer the evidence of Ms Kreleger and Dr Rutter in relation to the extent of potential microbial contamination of groundwater. Given the high sensitivity of the receiving environment and the limited information regarding groundwater levels at the site, we consider that a conservative assessment approach is appropriate.
- 131 We observe that bore M35/ 0325 is located 425m east of the site and could be affected if significant microbial contamination occurred. The DWPZ for this bore covers the northern part of the proposed quarry. The evidence is that flow direction, whilst generally towards the southeast, is variable and preferred flow channels can exist.
- 132 Both Ms Kreleger and Dr Rutter considered that a water level forecasting model is key with respect to managing the proposed operation and reducing risks to groundwater. We agree with their view that such a model should be developed for review as part of the assessment, to better inform the adequacy of proposed site management procedures and the potential for standing water in the pit that could be a source of contamination.
- 133 Mr Simpson noted that the backup community drinking water supply bores for Rangiora are not currently tested for the presence of hydrocarbons and other contaminants that could be present in non-compliant VENM material, but that chlorine disinfection would be provided to treat potential bacterial contamination. However, he pointed out that such disinfection would not treat protozoa. Having taken Dr Rutter’s advice into account, he considered that adverse effects on drinking water supplies had not been adequately addressed in the application.
- 134 Several submitters have expressed concerns regarding potential effects of the proposal on groundwater and drinking water supplies, and the degree of rigour associated with assessment of those effects.

- 135 Ms Lamplugh noted that the removal of the top gravel layers at the site could result in “short circuiting” of the passage of contaminants to the underlying aquifer. Mr Winks stated that the topsoil layer provides groundwater protection from contamination and the treatment of public water supplies should not be relied on as an “ambulance at the bottom of the cliff”.
- 136 Mr Downes considered that an insufficient degree of scientific investigation had been undertaken, particularly in relation to the groundwater assessment. Mr Dickson stated that the proposal negates most barriers to contamination and the remaining measures rely heavily on human intervention. He considered that a 1m separation between quarrying and the highest groundwater level should be viewed as a “last line of defence”.
- 137 We find that the concerns expressed by these submitters in relation to contamination of shallow groundwater in this sensitive environment have validity and conclude that the proposal has potential to cause microbial contamination of shallow drinking water supplies.

Risks Associated with Contaminants in Deposited Material

- 138 The proposed process for quality assurance, acceptance and screening of backfill material (VENM) has been described in evidence by Mr Singson. Conferencing has subsequently occurred between the contaminated land experts (Mr Singson and Ms Iles) and they now agree on a revised protocol, including that a Suitably Qualified and Experienced Practitioner (SQEP) should assess all sites where VENM is sourced at the pre-selection stage.
- 139 Ms Iles considered that the most stringent waste acceptance processes should be applied to this proposal but did not specifically recommend the sampling of every load of VENM material. She considered that a thorough assessment of the entire source site by a SQEP, as well as the agreed verification and audit procedures would be a more robust means of reviewing waste acceptance than selective sampling of every truck load.
- 140 With the exception of the agreed SQEP pre-selection analysis for all sites, the evidence is that the proposed protocol is generally in accord with the WasteMINZ Technical Guidelines for auditing and verification sampling.
- 141 We note that Ms Iles stated that the WasteMINZ guidelines do not anticipate deposition of clean fill material into such a sensitive groundwater receiving environment. Mr Withell and Mr Cornwall submitted that contaminant testing should occur for each load of VENM received. Mr Withell noted that contamination can vary across a site and a sampling protocol should be specified to capture such variability. Mr Simpson considered that the WasteMINZ guidelines do not go far enough in this case to protect drinking water supplies. He observed that even with site inspection and assessment, contaminated areas within a site can be missed.
- 142 The proposed verification procedure involves sampling of VENM material for contaminants, with one sample taken per 500m³ of material. We heard from Mr Taggart that this equates to one sample taken for approximately every 40-50 truckloads, depending on the capacity of the trucks used.
- 143 In the event that contaminated material was identified by the testing procedure, significant effort and expense could be required to locate and remove potentially contaminated material already deposited as backfill. In her summary statement (paragraph 14) Ms Iles stated that “further detail into exactly what the auditing procedure will involve needs to be provided”. Based on the evidence, we find that

there is a degree of risk that contaminated material might not be detected and could subsequently be deposited in the pit below the highest recorded groundwater level. We accept that the degree of risk is difficult to quantify.

- 144 The shallow average groundwater depth beneath the site and fluctuations in groundwater level are such that the presence of any contaminated material amongst the VENM would be likely to result in leaching of contaminants into shallow groundwater.
- 145 Ms Iles stated that despite the VENM protocols now proposed, there remains a risk that not all contamination would be identified. In relation to the pre-selection procedures, she observed that SQEPs are regularly relied on for this type of work, but it is possible for contaminated material to not be identified. She cited the waste pit area recently identified at the site, in the area of the proposed eastern monitoring bores, as a good example. If consent was granted, this area would now require further investigation for contamination, prior to establishment of any groundwater monitoring wells.
- 146 In her summary statement (paragraph 27) Ms Iles concluded that the discharge of contaminated backfill material may result in an impact on groundwater quality. She considered that the proposed waste acceptance procedures now agreed are thorough and would help minimise the risk of discharging contaminated material. However, she determined that it is not possible to fully eliminate the risk if quarrying and backfilling is to occur.
- 147 In response to our questioning, Ms Iles verbally confirmed that there would remain a “definite risk” of contamination associated with deposition of VENM material at this site, with potential need to remove deposited material on the basis of identification of contamination via verification sampling. Ms Kreleger stressed that prevention of contamination is key, noting that it could be difficult to subsequently locate a contaminant source within the quarry.
- 148 Mr Thomas discussed monitoring of groundwater undertaken by Environment Canterbury downgradient of quarries in the Miners Road area at Yaldhurst where clean fill deposition occurs. Sampling involved private water supply wells located within distances of 200m to 1000m from the quarries, which he noted is similar to the distances to neighbouring wells from the proposed quarry.
- 149 The Environment Canterbury report for the Miners Road study concluded that there are more dissolved chemicals in the groundwater directly downgradient of the quarries, relative to background concentrations. The effect was evident as degradation in the aesthetic properties of groundwater. Mr Thomas noted that the study concluded that the detected contamination is localised and generally dissipates within a few hundred metres of the quarry and fill areas. There was no evidence that the quarries have made groundwater unfit for drinking at the nearby domestic wells.
- 150 In discussing the Miners Road groundwater quality study, Ms Iles observed that there are no results available from a similar investigation for quarries where clean fill is frequently saturated by groundwater, as would occur for this proposal. She stated that it is generally accepted and expected that buried material above the highest groundwater level will have a lower leaching risk than material buried within the range of groundwater fluctuations.
- 151 Therefore, she considered that the actual effects on groundwater quality could be significantly larger than potentially expected based on the Miners Road

investigation. Ms Iles further noted that downgradient shallow water supply bores depend on good taste, low hardness and clear water.

- 152 We accept the evidence of Mr Thomas that the VENM material accepted for the site would have less potential to contain contaminants, including those affecting aesthetic properties of groundwater, than the clean fill that has typically been deposited at the Miners Road quarries.
- 153 However, we find that deposition of material subject to inundation with groundwater significantly increases the risk of leaching of contaminants. We conclude that the Miners Road study is not directly comparable to the proposal and does not provide clear evidence that contamination of drinking water supplies is not likely to occur.
- 154 We note the evidence that VENM material of variable type has potential to reduce the filtering effect of in-situ strata and thus increase the risk of any contamination at the surface leaching through to shallow groundwater.
- 155 We find that this risk, and the risk of leaching from unidentified contaminated material, would be substantially reduced if quarrying and VENM deposition was restricted to 1m above the highest recorded groundwater level.
- 156 Taking into account the high sensitivity of the groundwater resource at this location, we determine that the potential adverse effects of backfilling the quarry to a depth of 5m below ground level in the proposed manner are not acceptable.
- 157 In her reply Ms Thomas contended that the applicant's proposal can be distinguished from previous proposals (such as the joint applications by members of the Canterbury Aggregate Producers Group to deepen a number of existing quarries in Canterbury) for several reasons, including the fact that backfill is limited to VENM and on the basis of the stringent backfill acceptance procedures proposed.
- 158 However, we accept the evidence of Ms Iles that, despite the acceptance procedures now proposed (including analysis of the source site by a SQEP), there would remain a definite risk of contamination associated with deposition of VENM material at this site, with potential need to remove deposited material on the basis of identification of contamination, either via verification sampling or monitoring of groundwater quality.
- 159 We are aware that locating a contaminant source or sources within the quarry could be difficult and require considerable time and expense to remediate the site. We are also conscious of the high sensitivity of the receiving environment in this case in relation to public drinking water supplies.

Groundwater Quality Monitoring and Proposed Remediation Measures

- 160 Expert conferencing occurred between Mr Thomas, Ms Kreleger, Dr Rutter and Mr Simpson regarding potential conditions addressing groundwater matters. Following this conferencing the attendees were largely agreed regarding the form of groundwater quality monitoring conditions. It is now proposed that 10 monitoring bores would be established within the site and on land immediately east of the site. Baseline water quality monitoring would occur monthly for a period of one year in all bores located within 500m of the site to determine background concentrations. Contaminant trigger levels would then be set at the 95th percentile of measured values in those bores plus 10%. In response to

questions, Ms Kreleger confirmed that setting of groundwater quality trigger levels in this manner is a conservative approach.

- 161 It is proposed that, after commencement of quarrying, groundwater quality in the 10 monitoring bores would be measured every three months. The experts confirmed that this is a practical approach typical of monitoring employed at other quarry sites.
- 162 However, they also observed that the frequency of monitoring (three-monthly) and spatial separation of bores can result in any contamination not being detected for a period of time. Mr Simpson noted that the agreed conditions do not include any allowance for event-based sampling, in response to periods of significant rainfall. He considered that such event-based sampling should be required if consent is granted. Ms Kreleger considered that the monitoring is primarily designed to identify larger, higher risk contamination events.
- 163 Regular monitoring of water quality in downgradient domestic and community water supply bores is not proposed. Such monitoring would only occur in the event of exceedance of the trigger levels based on three-monthly sampling of the 10 proposed monitoring bores.
- 164 We determine that, if a contamination event occurred, there is a possibility that water quality could be affected in downgradient bores (notably the community supply bores) for a period of time before monitoring was undertaken in the affected bores.
- 165 Dr Rutter stated that studies have shown that there is potential to miss contamination peaks, even with the proposed array of monitoring bores. She referred to a tracer study undertaken in Burnham that indicated even a comprehensive monitoring array can miss detection of contaminants spatially. She noted that regular monitoring of downgradient domestic and public supply bores could provide a safety factor in this regard.
- 166 Ms Kreleger noted that, if contamination is detected as a result of deposition of hard fill, remediation works could involve considerable time and expense. Thus, if contamination was detected late in the term of consent sought, works could not continue at the site and the source would need to be found and remediated.
- 167 A substantial bond would be necessary to cover such circumstances and ensure sufficient funds were available for proper remediation, potentially extending beyond the term of consent. Such a bond has now been included in the proposed conditions of consent. However, we consider there would be considerable challenges to determine an appropriate bond value to cover possible outcomes caused by contamination by fill. Even if these challenges could be addressed a bond deals with costs of remediation and mitigation and is not an avoidance mechanism. We consider mechanisms to avoid contamination, or the risk of contamination, are necessary given the sensitivity of the receiving environment and are more useful than a bond in meeting the purpose of the RMA.
- 168 The Applicant has proposed remediation in the event of any detected contamination of drinking water supplies in down-gradient bores. Such remediation would involve supplying alternative sources of drinking water to the affected bores.
- 169 We accept the view of Ms Dawson that “reacting to groundwater quality degradation may be extremely difficult and can be very disruptive to those affected.”

- 170 Mr Simpson stated (paragraph 50 of his summary statement) that work to provide an alternative supply for the Ayers Street wells is complicated and likely to involve substantial costs and time to implement. He noted that deepening of the existing bores may not achieve the same quantity of water at an appropriate water quality. He expressed concern that contamination would likely remove the backup community drinking water supply for Rangiora for an extended period of time, potentially 1-2 years or longer. This would leave the Rangiora water supply at risk of restrictions or outages if the current water supply from the Kaiapoi deep wells was damaged or out of service.
- 171 In relation to domestic bores, we note the new information provided by Ms Thomas in closing indicating that most, if not all, domestic bores within 1000m downgradient of the site appear to have at least the opportunity to connect to the reticulated water supply.
- 172 We reiterate that we are concerned that this new information has not been tested or confirmed by direct contact with the property owners and it is not certain if all properties have chosen or been able to connect to the reticulated supply. We heard that water quality in domestic bores is not typically tested on a regular basis. We are aware that any affected users of domestic bores may not wish to be provided with a chlorinated replacement supply.
- 173 We find that the focus should be strongly on prevention of contamination of groundwater in this highly sensitive environment and accept that significant adverse effects could be associated with any need to replace drinking water supplies with alternative sources. Remediation of contaminated drinking water supplies is not considered to be the most efficient option. We agree with Ms de Wit that substantial importance should be assigned to ensuring ongoing safe drinking water supply to Rangiora.

Complexity of the Proposal

- 174 Submitters and officers have raised concerns regarding the complexity and practicality of measures required to maintain a 1m separation from real time groundwater levels. Ms McKay succinctly observed that “complexity is the enemy of execution”. Mr Schulte noted that the scale of the quarry operation is small relative to the complexity of the proposal.
- 175 The proposal to excavate below average groundwater levels at the site involves a complex suite of conditions that would need to be diligently met to control adverse effects. Detailed management plans would be required, with measures determined based on groundwater level information and a forecasting model that is not yet available.
- 176 The required measures are somewhat onerous, with the need for backfilling and then subsequent removal of VENM material before further gravel can be extracted. We consider that the risk of non-compliance with such complex conditions is real, even with the best efforts of a consent holder. We accept the view of Ms Dawson that the complex conditions proposed do not align with good planning practice, in that it is not clear if they can be physically or technically met.
- 177 Selection of an alternative quarry site, where a 1m separation could be maintained to the highest recorded groundwater level, would likely result in a substantial reduction in the complexity of mitigation measures (and associated costs) required and also a reduction in risks to groundwater quality.

Risk

- 178 Risk to groundwater is a key issue. Section 3 RMA provides for the purposes of the RMA the term “effect” includes any potential effect of low probability which has a high potential impact. So even if we were to accept the proposed conditions will result in a low probability of an adverse effect occurring, we remain concerned that any such effect would have a high potential impact on drinking water.
- 179 Ms Thomas in her reply sets out submissions in relation to the proper approach to risk under the RMA. She submits that the RMA does not promulgate a no risk approach. She submits that case law indicates that a certain element of risk is acceptable. We accept that.
- 180 However, we also accept her submission that the measure of risk and its assessment and the acceptable degree of risk avoidance are matters of fact in each particular case.
- 181 In this case we do consider we have evidence of potential adverse effects or risks to the environment. We are not relying on suspicion or innuendo but expert evidence.
- 182 We are concerned about the gravity of effects, even taking into account levels of uncertainty if those effects were to occur. Based on the evidence we received we conclude that effects on groundwater quality would likely be serious, and we are unsure whether or not they would be irreversible.
- 183 We accept and we are aware the RMA does not endorse a “no-risk regime “. We think that in our consideration of groundwater issues we have recognised that.
- 184 Ms Thomas in her reply also addressed the precautionary approach, acknowledging such an approach is necessary when considering effects which are of low probability but which have high potential impacts. She also recognised, as we do, that policies within the relevant planning instruments, particularly Policy 7.3.12 of the Canterbury Regional Policy Statement (CRPS) in relation to the discharge of contaminants where the effects of an activity either singularly or cumulatively are unknown or uncertain.
- 185 Further, she contended that a precautionary approach had been applied and undertaken in the assessment of this proposal and that the consent conditions proposed are also precautionary. She cautioned against a further application of the precautionary principle because that would lead to a double counting of the potential effects of low probability with a high potential impact.
- 186 However, Ms Thomas did note that a precautionary approach beyond what is implicit in the RMA may be applied depending on the findings made on the evidence about likely effects of the proposal. She contended in her reply that there was no evidence that serious or irreversible harm to the environment would be or is likely to be caused by this proposal. However, for the reasons advanced above, we disagree on this point.
- 187 We have concerns about the appropriateness of the proposed conditions in relation to a number of matters but particularly those ensuring contaminants are not included within VENM to be utilised as clean fill, those related to groundwater monitoring and those related to remediation and provision of alternative water supplies. Given our concerns about the appropriateness of those conditions, we are concerned that the proposed activities would likely cause serious and possibly irreversible harm to groundwater and drinking water supplies.

Summary Regarding Effects on Groundwater Quality

- 188 Overall, we find that the proposal poses significant risks to groundwater quality. Excavation below highest groundwater levels at the site has potential to result in microbial contamination of shallow groundwater that could affect drinking water supplies.
- 189 The complexity of the proposal is such that maintaining a 1m separation between the base of the quarry pit and real time groundwater levels would be difficult to achieve at all times.
- 190 We consider that there is a definite risk that contaminated material could be inadvertently deposited in the pit with subsequent leaching of contaminants into shallow groundwater.
- 191 We conclude that such a contamination event is of low to moderate probability but would have significant consequences. We accept the evidence that remediation of drinking water supplies, notably the Rangiora backup community supply, would be difficult and could take a substantial period of time.
- 192 We determine based on the evidence that potential adverse effects to drinking water supplies in this sensitive receiving environment are not acceptable.

(b) Actual and Potential Nuisance and Health Effects Arising from the Discharge of Dust

- 193 Various activities associated with the proposed quarry generate dust (particulate matter). These activities and the primary dust generating sources are described in the evidence of Mr Bluett. The experts (Messrs Bluett, Chilton and Van Kekem) agreed that dust emissions will primarily consist of coarser particulate matter that has potential to cause nuisance effects and soiling of property. A proportion of total suspended particulate matter (TSP) discharged includes the fine fraction PM10 (particles having a diameter of less than 10 microns) and respirable crystalline silica (RCS).
- 194 Mr Chilton noted that the application includes the excavation of gravel for transport to the Cones Road site, where processing will occur in accordance with the discharge permit for that site. He considered that this is an important feature of this application because processing (including crushing and screening) of aggregate is often a significant source of TSP and RCS associated with quarrying.
- 195 The main sources of dust emissions from the site are categorised as: stripping of overburden and formation of bunds; excavation and stockpiling of material; and movement of heavy vehicles associated with the transport of gravel and backfill material.
- 196 Mr Chilton also pointed out that an important additional consideration for this proposal is that the area of excavation and backfilling would be relatively small, limited to less than 2 hectares. This limits the spatial extent of dust generating activities and exposed surfaces that would be subject to wind entrainment of dust.

Health Effects of PM₁₀ and RCS

- 197 Several submitters have raised concerns regarding the potential health effects of particulate matter, primarily in relation to PM10 and RCS discharged from the proposed activities.

- 198 Mr Brown noted the close proximity of the holiday park at 337 Lehmans Road to the proposed works, particularly in relation to the establishment of the western bund. He pointed out that approximately 100 permanent residents at the holiday park could be affected.
- 199 Mr Mulqueen, Mr Barber and Ms Downes all referred to specific health issues that they considered could cause greater sensitivity to the effects of such contaminants than the general population.
- 200 Mr Mather and other submitters considered that the presence of RCS in the discharge is a key element and that a 500m setback from dwellings should be applied in accordance with Victoria EPA guidelines and recommendations of the District Health Board.
- 201 With regard to the reference to a 500m setback from sensitive activities, we note that such guidance from Australian EPAs has not been formally adopted in New Zealand. Rather, the separation distances from dwellings and other sensitive activities are typically considered for each consent application based on the specific circumstances of the case and assessment of effects.
- 202 In this case the air quality experts are agreed that RCS emissions would not be significant, due to the lack of on-site processing, and that management measures can be applied to prevent adverse effects of the discharges at neighbouring receptors. Based on the suite of conditions now proposed, we accept their expert opinion that the separation distance from sensitive receptors is adequate.
- 203 All the air quality experts agreed that ambient concentrations of PM₁₀ and RCS are not expected to approach guidelines for the protection of human health at sensitive receptors, including the holiday park, aged care facilities and dwellings, provided the proposed mitigation measures are implemented. Specific mitigation and monitoring measures are proposed when works occur within 250m of sensitive receptors.
- 204 We accept the evidence of Messrs Bluett, Chilton and Van Kekem that adverse health effects of RCS and PM₁₀ are unlikely if the activity occurred in accordance with the consent conditions now proposed and largely agreed between the experts.
- 205 In reaching this conclusion we note that the applicant now proposes to lay a milled asphalt surface on the 540m long access road within the site. The evidence is that this would substantially reduce PM₁₀ emissions generated by truck movements.
- 206 On this basis we find that, if consent was granted to the proposal, the PM₁₀ contribution to the Rangiora Air shed is not expected to exceed the limit of 2.5µg/m³ (24-hour average) set by Regulation 17 of the NESAQ. With regard to RCS, we find that the absence of processing would limit emissions from the site and we determine that the measures now proposed are sufficient to prevent adverse health effects of this contaminant.

Dust Nuisance Effects

- 207 The applicant has proposed various mitigation measures to control dust emissions from quarrying and backfilling activities. These measures are prescribed in the set of conditions now largely agreed by the experts and would also be detailed in the Air Quality Management Plan (AQMP) proposed. The key dust controls include:

- Applying water to dry exposed surfaces using water carts and fixed sprinklers at the material stockpiles;
- Sealing of the site access road with milled asphalt and maintaining that surface;
- Prohibiting on site processing of aggregate;
- Limiting VENM stockpiles to not more than 5m in height at a specified location;
- Carrying out land stripping and rehabilitation when wind speeds at the site are less than 7m/s;
- Restricting activities upwind of sensitive receptors (such as dwellings) within 250m when the wind speed exceeds 7m/s;
- Restricting vehicle speeds on site;
- Setting PM₁₀ trigger levels to be measured in at least two continuous monitors, to be operated when dust generating activities occur within 250m of sensitive receptors, that would require remedial action and cessation of works if triggers were exceeded.

- 208 We determine that the dust control measures now proposed by the applicant are generally appropriate and, if diligently implemented, would be expected to prevent dust nuisance effects at neighbouring properties.
- 209 We do note the concerns raised regarding the high sensitivity of the holiday park on Lehmans Road and the close proximity to the proposed western bund. Careful management would be required when forming this bund. However, appropriate controls have been proposed (to be included in the AQMP) and the proposed continuous PM₁₀ monitoring with triggers is an appropriate means of ensuring such controls are implemented to prevent nuisance effects.
- 210 Considerable discussion occurred between the experts regarding the selection of either PM₁₀ or TSP to be measured by the two continuous monitors proposed for the purpose of managing dust generating activities occurring within 250m of sensitive receptors.
- 211 Messrs Bluett and Chilton considered that the use of nephelometers measuring PM₁₀ is sufficient for this purpose, while Mr Van Kekem recommended the measurement of TSP. He noted that TSP monitoring would target the particle size range of concern for dust nuisance effects. However, Messrs Bluett and Chilton considered that PM₁₀ and TSP concentrations are correlated and pointed out that PM₁₀ monitoring for this purpose occurs in at least five Canterbury quarries.
- 212 We have determined that, if consent was granted, monitoring of PM₁₀ subject to the proposed trigger levels would be sufficient for the purpose of managing activities to control dust nuisance effects.
- 213 The proposed PM₁₀ trigger levels for continuous monitoring are appropriate and are relatively stringent when compared to the values recommended by the Ministry for the Environment in the Good Practice Guide for Assessing and Managing Dust.
- 214 We agree with Ms de Wit that these trigger levels should be set in conditions of consent, as now proposed, rather than being left for inclusion in the AQMP.
- 215 Mr Downes submitted that NES-compliant PM₁₀ monitoring should be required. Based on the proposal to now surface the access road with milled asphalt, we accept the expert evidence that 24-hour average PM₁₀ concentrations caused by

the proposed activities at dwellings and at the Rangiora Air shed are expected to be small. We find that full NES-compliant PM₁₀ monitoring, involving substantial cost, would not be necessary in this case.

- 216 The AQMP was in draft stage at the time of the hearing and contained little detail. Ideally the management plan would have been advanced further for our consideration at the hearing.
- 217 However, proposed conditions of consent have been further developed and specify the detail to be included in the AQMP. They also require that the AQMP be prepared by a SQEP, peer reviewed by a SQEP, and certified by the Council. We consider that the conditions now proposed in relation to the discharge to air are generally appropriate and would adequately control the effects of that activity.
- 218 Some discussion occurred regarding the adequacy of water supply for dust suppression, to be obtained from a bore at the Racecourse. In her closing, Ms Thomas confirmed applicant's view that the quantity of water authorised by the Racecourse water permit is available and would provide a reliable supply given the depth of the bore.
- 219 We are satisfied that, if consent was granted, sufficient water would be available for dust control purposes, noting that water tankers could be brought to the site if the on-site water supply failed.
- 220 The air quality experts did not agree on the need for covering of truck loads leaving the site. Mr Bluett considered that the material would be generally in a damp state and covering is not necessary, noting that the travel distance to the Cones Road site is small. Mr Chilton pointed out that covering of trucks is standard practice and considered that it should occur in this case to minimise dust emissions.
- 221 We determine that such a requirement is appropriate and find that, if consent had been granted, covering of loads would have been required.
- 222 Mr Downes and Mr Dickson raised concerns regarding the suitability of wind data from the NIWA Rangiora weather station that was used to inform the assessment of effects. They noted the proximity of trees to the weather station and considered that the Rangiora data may under-represent northwest wind conditions at the Racecourse site. Mr Chilton stated that, in relation to the assessment of effects, this would primarily affect the frequency that locations to the southeast of the site (including Huntingdon Drive) are affected.
- 223 We have noted the concerns expressed by submitters living in the Huntingdon Drive area. Mr Chilton, at paragraph 37 of his summary statement, considered that the proposed mitigation and monitoring provisions recognise these sensitive locations and that the dust controls would appropriately address effects in this area.
- 224 We accept his evidence in this regard. If consent was granted, the proposed on-site meteorological monitoring station would have gathered local wind data for the purpose of limiting activities during strong winds blowing towards sensitive areas.
- Summary Regarding Effects of Discharges to Air*
- 225 We determine that, if consent was granted to the proposal, the PM₁₀ contribution to the Rangiora Air shed is not expected to exceed the limit of 2.5µg/m³ (24-hour average) set by Regulation 17 of the NESAQ.

- 226 With regard to RCS, we find that the absence of processing would limit emissions from the site and we determine that the measures now proposed are sufficient to prevent adverse health effects of this contaminant. We accept the expert evidence that any health effects associated with the proposed discharge are not expected to be significant.
- 227 Comprehensive dust control measures are now proposed in a suite of consent conditions that are largely agreed by the experts. An AQMP would be prepared by a SQEP and certified by the council to assist in the implementation of dust mitigation.
- 228 We consider that the proposed continuous PM₁₀ monitoring with triggers is an appropriate means of ensuring mitigation is implemented to prevent nuisance effects at sensitive neighbouring properties.
- 229 Overall, we determine that, if consent was granted, the activity could be undertaken in a manner that does not cause significant dust nuisance effects.

(c) Actual and Potential Transportation Effects

- 230 Submitters raised concerns regarding increase in heavy vehicles arising from quarrying activity. Submitters were concerned about what routes those heavy vehicles would utilise.
- 231 Submitters also raised issues with the transportation of backfill to the quarry. They were concerned that the local roading network may become clogged with heavy vehicle movements.
- 232 Submitters were also concerned about impacts on road safety outcomes given the increase of heavy vehicle movements on the roading network.
- 233 Finally, submitters raised concerns about the potential impact of road degradation arising from additional heavy vehicle movements. Further, some submitters were concerned about impacts on public transport.
- 234 We had the benefit of expert evidence from Mr Matthew Noon for the Applicant and from Mr Chris Morahan engaged by WDC. The two experts caucused and provided a joint witness statement. Through the evidence and that joint witness statement they addressed in our view satisfactorily many of the traffic and transportation concerns raised by the submitters.
- 235 The Applicant confirmed that the maximum vehicle movements to and from the site would be 240 one-way trips. This is below the high trip generation rule in the Waimakariri District Plan and is therefore a permitted activity. Effectively this number of one-way trips per day would equate to a maximum of 32 vehicle movements per hour.
- 236 The quarried material will be predominantly carted 1.4 kilometres along River Road and Cones Road to the Applicant's existing processing site on Cones Road. We were told on occasion aggregate might be directly carted to and from construction sites within the district. We were also told about cartage of clean fill materials to and from the site which we will discuss later.
- 237 Both River Road and Cones Road are classified as a collector road in the Waimakariri District Plan. River Road has also been identified as a heavy vehicle bypass route.

- 238 The Applicant undertook monitoring in March 2021 on River Road so as to understand movements by heavy vehicles. As well Waimakariri District Council traffic count data from 2019 was considered.
- 239 We understood Mr Noon and Mr Morahan to agree that the existing traffic volumes on the surrounding roads were low enough to sufficiently accommodate the estimated 32 heavy vehicle trips per hour generated by the proposal so that no adverse effects on the road network relating to congestion or delays would be anticipated. We accept that opinion.
- 240 We note that Mr Morahan also assessed potential future growth of traffic in the area and concluded that based on the predicted low growth rate in the district the effect of the Applicant's proposed heavy vehicle movements would remain minimal. We agree with his opinion.
- 241 Both experts also assessed traffic volumes if quarrying activity and racecourse events were to occur concurrently. They both agreed concurrent activity was expected to have little impact on existing road users on the surrounding road network. This is because quarry related movements would utilise River Road and racecourse related movements would more likely use Lehman's Road, both roads being approximately 1.7 km apart.
- 242 Returning to transportation of clean fill to the quarry Mr Noon, accepting limited information is available as to the locations of sites where clean fill will be obtained, provided a range of assumptions as to the likely location and consequent travel routes to be used by trucks carting clean fill to the site. He assumed clean fill material could be derived from the north-west, east and south of the site.
- 243 Mr Noon noted that heavy vehicle operators and drivers prefer to route vehicle movements along higher classification roads such state highways, strategic or arterial roads. They provide a higher level of service and priority. Operators and drivers prefer, he said, to use those types of roads over local roads.
- 244 Local roads, he said, were more likely to be affected by narrower widths, on street parking, pedestrians and cycle movements. These matters affect the ease of movement of the heavy vehicles and therefore local roads would be an undesirable choice for drivers he advised. We accept his opinion in this regard.
- 245 Taking into account the export of gravel from the site and importation of clean fill, both Mr Noon and Mr Morahan were of the opinion that specific movement control measures such as restrictions on heavy vehicle routes were not required. Essentially this was because the roading network experienced reasonably low usage and there were benefits in maintaining operational flexibility. We accept their opinions.
- 246 As well, both Mr Noon and Mr Morahan noted the Applicant has confirmed that all Applicant vehicles are GPS tracked so that monitoring and/or a tracking system could be deployed that would allow the consent authorities to monitor movements if that happened to be required in the future or as a consequence of any conditions of consent. We agree.
- 247 As to traffic volume and road safety and effects on other road users, Mr Morahan was of the view that provided the River Road proposed access was upgraded in the manner he recommended, (which the Applicant accepted) then quarry traffic on River Road would not cause or lead to a road traffic safety issue. Mr Noon was of the opinion that, given Lehman's and River Road had been identified by the District Council as a heavy vehicle bypass, then in doing so the district had

considered the overall network performance and were satisfied that Road safety matters were appropriately addressed. We agree with both opinions.

- 248 Submitters raised concerns about pedestrian and cyclist safety arising from the use of a natural crossing point across River Road immediately west of West Belt. While Mr Morahan acknowledged that those pedestrians and cyclists would benefit from a safety upgrade to this crossing, he did not consider that there were any effects arising from this proposal in relation to traffic that justified the imposition of a condition to support such an outcome. We accept that advice.
- 249 On the pedestrian crossing and cyclist safety issue, Mr Noon pointed out that monitoring undertaken in March 2021 identified a reasonably limited number of pedestrian and cycle movements occurring in this vicinity. He identified for us the presence of off-road and pedestrian and cycle paths along River Road between West Belt and Lehman's Road. These are informal paths created by frequent usage.
- 250 Nevertheless, we accept and agree with him when he said that because of the presence and use of these paths there is unlikely to be any conflict between heavy vehicle movements, pedestrians and cyclists.
- 251 Mr Noon also noted that the posted speed limit is 50km/h and that between the River Road/West Belt intersection and Cones Road there is a formed footpath on the south side of the road separated by a grass verge from the carriageway. It was his opinion given the nature of this environment that it was unlikely there would be any conflict between active modes of vehicles. We agree for the reasons he advances.
- 252 On road degradation, Mr Noon was of the view that the total volume of additional traffic proposed is within the expected daily flows for the classification of that part of the roading network. He assumed therefore in making that classification that an expected volume of traffic for the road would have been considered along with an appropriate maintenance regime reflecting that traffic flow.
- 253 To assist with avoiding roading degradation the Applicant proposed to seal the site access road and also to install rumble strips to remove any loose material on trucks prior to exiting the site.
- 254 Mr Morahan was of the view that there will be increased maintenance requirements in the wider roading network. However, truck operators will be required to pay for this maintenance through the existing road user charges and it was his opinion no further mitigation was necessary. Again, we accept these views.
- 255 Mr Noon commented on concerns raised by submitters relating to potential impact on public transport services. He identified the two available public transport services that operate along River Road. He noted that there are no street stops located on River Road and that the overall average frequency of the public service is low. It was for these reasons he provided the opinion that the vehicle movements related to the proposal will not negatively affect the operation of the services. For the reasons he advanced we agree.
- 256 Finally turning to onsite parking, we note the two experts agreed that the assessment of on-site parking was considered accurate and that the non-compliance they both identified would not have any adverse effects. We agree.

- 257 We acknowledge we received a significant volume of material from residents about traffic safety, road capacity and traffic noise issues. We do not discount the value of understanding the local traffic environment. However, we have preferred expert traffic evidence and related opinions.
- 258 Our reasons include those opinions are given by experienced and suitably qualified experts. Their views are based on data from independent sources. Also, modelling has been utilised where it has been critiqued by the experts and found to be appropriate to support assessments.

Summary of Transportation Effects

- 259 In summary we conclude, taking into account the results of the traffic experts' modelling and trip generation assessments, that the effects of increased vehicle movements on the local road network will be no more than minor.
- 260 Provided access to the site is upgraded in accordance with the WDC engineering code of practice we agree that the potential effects on road safety of the quarry operations will be minor.
- 261 Taking into account the mitigation measures proposed by the applicant, including the sealing of the access road and installing a rumble strip, we have concluded that the potential impacts on road conditions causing need for road maintenance will be no more than minor. In any event we accept Mr Morahan's advice that in terms of maintenance requirements truck operators will be required to pay for this maintenance through existing road user charges and no further mitigation is necessary.
- 262 Finally, in terms of parking and loading and on-site manoeuvring requirements, we accept the advice that none of the activities and associated on-site parking and loading standards in the District Plan apply to this proposal. In any event all of these matters can be accommodated on the large site without a formal area being provided for the same.

(d) Actual and Potential Noise and Vibration Effects

- 263 The Applicant noted that sound generated primarily from machinery working in the quarry may constitute an undesirable noise. As well as heavy machinery operating within the quarry there will be heavy truck movements to and from the site. The loading of trucks with aggregate and the unloading or tipping of backfill and other materials on site could all lead to undesirable noise. This is particularly so from the perspective of the occupants of dwellings located near the quarry site.
- 264 Marshall Day, acoustic specialists, provided an assessment of the potential noise effects. This assessment was peer-reviewed by Mr Reeve, a specialist section 42A reporting officer.
- 265 Many of the submitters in their submissions in opposition raised noise and disturbance arising from quarry noise and adverse impacts on their residential amenity is a significant issue for them. In addition, we received much evidence from submitters who appeared at the hearing in relation to noise arising from a range of different quarry activities including trucking movements.
- 266 The acoustic specialists both agreed that the standards for noise referenced in the Waimakariri District Plan had been replaced by NZS 6801: 2008 and NZS6802: 2001, both of which use L_{Aeq} . Both agreed that this is consistent with best practice and supported by research relating to noise levels and amenity that is required to

be adopted by the National Planning Standards in the new district plan. The National Planning Standards, particularly standard 15, prescribe the national standards to incorporate via reference and noise metrics to use within District Plans.

- 267 The 2008 standards provide desirable upper limits of sound exposure at the notional boundary of any rural dwelling and for the residential zone. They are 55dB L_{Aeq} (15 min) for daytime, 50dB L_{Aeq} for evening and 45 dB L_{Aeq} for night-time, and 75dB L_{AFmax} .
- 268 As we understood matters an assessment against the District Plan provisions had been undertaken in accordance with the 1991 standards to classify the activity. However, the assessment of effects of noise had been undertaken in accordance with the 2008 standards.
- 269 Mr Reeve, when considering the Applicant's modelling methodology and analysis, informed us that both were appropriate and would provide conservative results. He also informed us that the sound power levels are generally consistent with his knowledge of similar measurements.
- 270 Operating the motor scraper received attention because the motor scraper has the potential to result in noise that exceeds the acceptable noise limits. The Applicant proposes to restrict the use of this machine to no more than 3.5 hours per day. Mr Reeve pointed out, because it is proposed to restrict its use, NZS 6802: 2008 allows for an adjustment of noise level up to 5dB of the source level which reflects that if a sound is not present all the time it is likely to create less annoyance.
- 271 Mr Reeve's point was that the duration adjustment included in the noise model was appropriate but he noted that the duration adjustment artificially reduces the noise from the motor scraper to comply with the adopted limit. He said there will be times during the day when noise levels up to 55dB L_{Aeq} would be permitted. Mr Reeve still considered that those effects would be acceptable but recommended a consent condition (which the Applicant agreed to) to limit the motor scraper use to 3.5 hours per day.
- 272 Mr Reeve identified some issues with the Applicant's modelling, namely that access to the excavation pit for all stages was to be via the same crossing point across the racetracks which is located near the South-East corner of the site. In particular this part of the activity was not reflected in the scenarios modelled. Mr Reeves noted that it is likely that the predicted noise levels may be greater than presented in the Applicant's noise report for those residents closest, namely the Huntingdon drive dwellings. They may, he said, experience greater noise than the predicted noise levels the Applicant provided.
- 273 Another area of concern was that the potential noise generated from activities associated with the stockpiles on the site had not been appropriately modelled. The proposed stockpiles may be up to 5 m in height which would be higher than the proposed boundary located acoustic bunds. If there was to be regular activity of machinery above the heights of the bund, for example, a water cart operating to dampen stockpiles, or the offloading of materials, then there would be no screening of machinery noise to the closest dwellings. In these circumstances noise levels may be higher than predicted by the Applicant's modelling.
- 274 Ultimately within the joint witness statement dated 30 April 2021 between Mr Reeve and Mr Farren of Marshall Day for the Applicant, these matters were addressed. Additional modelling was provided with the updated internal haul route and access points included. This new noise modelling showed that there is a

negligible change for dwellings on Huntingdon drive. Noise levels would increase by 1dB at the closest dwellings on West Belt.

- 275 In terms of the stockpile activity, again new and additional modelling was undertaken which included trucks traversing the top of 5m high stockpiles. The modelling also included the operation of an excavator. We note that in his presentation Mr Taggart refer to the operation of such machinery on the stockpiles. The additional modelling showed that the predicted levels from both of these activities would remain below 50dB L_{Aeq} at the closest dwellings on West Belt.
- 276 Mr Reeve agreed with the results of the additional modelling, noting that in terms of the haul or access route being included within the modelling, that any predicted increase would not be generally perceptible and the noise limits would remain below the 50dB L_{Aeq} limit. The same outcome results for the modelling of the stockpiling activity. However, Mr Reeve did note that when extraction occurs in the north-east quadrant closest to the stockpiles at the same time as the stockpile activity occurs, there is the potential for a small breach of the proposed limit at the closest West Belt properties.
- 277 Nevertheless, Mr Reeve noted that the Applicant's noise emissions will be constrained by the proposed 50dB L_{Aeq} daytime noise limit and there is inherent conservatism in the modelling. Mr Reeve was of the view that this possibility of exceedance was best addressed by monitoring of the actual noise levels arising from the scenario to confirm that the proposed noise limits are being met.
- 278 For the reasons advanced above, primarily based upon application of the appropriate standard and the revised modelling and the assessment of the same by both acoustic experts, we agree with the noise assessment, and we accept and support the conditions proposed in relation to the upper limits of sound exposure at the notional boundary of any rural dwelling and for the residential zone at daytime, evening and night-time periods.
- 279 Traffic noise, particularly experienced by residents along River Road and other roads which will be frequently utilised by quarry traffic, was a major concern of submitters. The acoustic experts, within their joint witness statement, recorded that they agreed, taking into account the character and overall noise levels, that traffic noise effects will not be significantly different for dwellings closest to River Road.
- 280 The Applicant took the view that while transportation noise is exempt from assessment under the District Plan noise standards, the potential noise effects of the activity is a valid consideration. Ms Dawson directed us to some district plan provisions noting that the plan itself is silent on whether traffic noise is an activity controlled by its provisions.
- 281 Nevertheless, the Applicant and Mr Dawson assessed the noise associated with heavy vehicle movements between the site and the Applicant's Cones Road processing site on the basis that this would be a frequently travelled route by trucks carting gravel from the quarry site for processing. The Applicant provided assessment of the expected traffic noise currently on River Road measured at the dwellings on River Road. The Applicant contended an additional 250 truck movements per day is not expected to increase the average traffic noise but will change the character of the traffic noise, particularly at peak times.
- 282 Mr Reeve in considering the Applicant's assessment noted that this assessment was based on current traffic flow of 3500 vehicles per day from traffic counts between Jones Road and Enverton Drive. Importantly he noted that the traffic counts east of West Belt were lower, being some 2155 vehicles per day. This

means he noted that dwellings closest to River Road located between Ballarat Road and Enverton Drive are likely to be exposed to lower existing traffic volumes than those assessed by the Applicant and the relative contribution of heavy vehicles will be higher. Mr Reeve concluded that the average traffic noise levels will increase by approximately 2dB at the dwellings closest to River Road.

- 283 In terms of the significance of that increase Mr Reeve referred us to NZS 6806: 2020 Acoustics-Road traffic noise-new and altered roads. He noted the direction provided in the standard suggests that no assessment of noise effects is required for altered roads where a road results in an increase of less than 3dB L_{Aeq} (24hour) which would be the case here.
- 284 Mr Reeve further advised that there are already periods the day when high noise levels are received at the closest dwellings to the site and that the overall change in the 24-hour peak hourly noise levels will not be significant.
- 285 Based on the advice of Mr Reeve, Ms Dawson consider the effects of traffic noise on dwellings along River Road will be acceptable. While there may be a noticeable increase in noise levels associated with greater truck movements, as these properties are already subject to noise levels well in excess of New Zealand standards, she considered that an increase is unlikely to lead to further behaviour modification on behalf of residents such as closing windows or avoiding certain activities due to noise. She concluded, and we agree based on the opinions of Mr Reeve, that the effects of traffic noise will be no more than minor.
- 286 Vibration effects of quarry traffic again received much attention from the submitters who appeared at the hearing and those who had lodged formal submissions. We acknowledge those concerns. However, we do have to evaluate those concerns alongside the specialist evidence we have received. The acoustic experts were of the view, when taking into account the character and overall noise levels, that traffic noise effects will not be significantly different for the dwellings closest to River Road.
- 287 Similarly, vibration effects were raised by submitters J Anderson, M and C Battersby, R and J More, and E Robinson who all expressed concerns about vibration generated by quarry trucks utilising River Road. We acknowledge the concerns of the submitters.
- 288 However, the acoustic experts were of the view that the vibration generated by quarry trucks is unlikely to result in a difference in level when compared to heavy vehicles currently using the road. The experts acknowledged, as we do, that the number of perceptible events may increase at the closest dwelling as a result of the increased heavy vehicle traffic. However overall effects will still be no more than minor.
- 289 We have considered the Applicant's proposed noise and acoustic conditions and mitigation measures. The acoustic bunds and restrictions on operating hours and machinery use and the conditions controlling levels of noise emitted from the site are key to ensuring the actual noise generated from the site is acceptable. The proposed bunds and operating hours for machinery use should ensure that activities at the site reflect and comply with the predicted noise levels.
- 290 We accept the specialist acoustic advice that the proffered conditions are appropriate to avoid remedy or mitigate any noise effects and to protect amenity of those occupying the dwellings closest to the quarry site.

291 We do note that in the conditions it is proposed that noise monitoring by a suitably qualified and experienced acoustic consultant will be undertaken within the first 12 months of commencing activities and when activities initially advance within 200m of the dwelling at 373 Lehmans Road and the Rangiora Eco-Holiday Park and within 350m of the dwellings at 321 West Belt and 55 Huntingdon Drive. These are the closest receptors at each corner of the proposed quarry.

292 We agree and consider that such a condition would alert the consent authorities to the need to take any action if there is exceedance of the noise discharge limits in the consent. However, if the monitoring demonstrates the noise limits are not being exceeded, then this would we think provide some level of surety to the residents about noise effects.

Summary of Noise and Vibration Effects

293 Taking into account the appropriate noise standards, noise sources and the modelling undertaken by the acoustic experts, we conclude that the effects on nearby dwellings in terms of noise will be acceptable. We acknowledge there may be a noticeable increase in noise levels associated with greater truck movements, but we also acknowledge nearby properties are already subject to noise levels well in excess of the New Zealand standards. Overall, we consider the effects will be no more than minor.

294 Similarly in relation to vibration, given some mitigation measures have already been proposed, such as sealing the access road, the installation of a rumble strip and regular vacuum sweeping of the sealed access road, we consider these would all reduce potential vibration associated with the trucks entering and exiting the site. In addition, it is our view that any remaining concerns could be addressed by the quarry and backfill management plan.

(e) Actual and Potential Landscape, Rural Character and Visual Effects

295 Many submitters raised concerns and questions as to how a quarry could be established at the Rangiora Racecourse, particularly as there are a number of residential areas close by. Many raised concerns about impacts on amenity and property values. Many were concerned property values would decrease if the consents were granted.

296 Many submitters made the point that they had, following the Christchurch earthquake, recently relocated to this particular neighbourhood because of its character and amenity. Some raised concerns that they would now be exposed to noise, dust and vibration. They were also concerned their rural outlook would change and the rural character of the area would change. They were further concerned about visual effects of the quarry, noting they much preferred a view of the racecourse rather than an operational quarry. Many make the point that the racecourse was accepted as a permanent fixture within the immediate environment.

297 Ms Dawson addresses some of these issues in her section 42A report at paragraphs 448 and 461. We agree with her analysis and her overall conclusions in regard to effects on landscape, rural character and visual effects.

298 The Waimakariri District Plan does address character of the rural environment but only in a broad way by seeking to maintain and enhance the existing rural character which is characterised by the dominant effect of paddocks, trees, and natural features, agricultural, pastoral and horticultural activities. In terms of amenity the District Plan sees the rural environment as being generally quiet and

being a zone characterised by clean air. However due to agricultural and horticultural activities the Plan recognises that there will be some short term, but significant seasonal odours associated with farming activities.

- 299 Specifically in relation to amenity values the District Plan seeks to maintain the amenity values and quality of environment in the rural zone which protects the health, safety and well-being of present and future generations. The subject site is rural. But it is surrounded by Residential 4B, Residential 4A and a Residential 2 zone to the east and south of the site.
- 300 The site, we think, is different in its use and character to a typical rural farm or horticultural property. We also note the presence of community activities such as the Sunday market set it apart from typical rural activities.
- 301 In any event Ms Dawson undertook a consideration of the activity and in particular mitigation measures, including acoustic bunds, considering how the same will operate to reduce noise and screen the site from adjoining properties. She noted that the hours of operation are relatively limited with no night-time activities unless required to suppress dust or for health and safety reasons. She also noted that the Applicant confirmed works on the site would not be continuous, rather they would occur in stages or campaigns as dictated by demand for material. However, in her view, and we agree with her, compared to the current racecourse use there will be both an increase in activity and the nature of the activity will be quite different.
- 302 Ms Dawson was of the view that the proposal will not have any significant visual effects and if there are any visual effects, they will be localised effects largely on those travelling along River Road.
- 303 Informed by our site visit we agree and adopt that finding. We also accept her assessment that once the bunds are established and they are covered with vegetation, given the available separation distances, the visual effects will be no more than minor.
- 304 In relation to impacts on rural character, given what we have said above, the District Plan does clearly envisage activities in the rural environment that will from time to time produce noise, dust and odour and more likely than not traffic.
- 305 Those activities would be noticeable to residents. Given the current use as a racecourse which gives rise to a range of impacts such as occasionally high levels of traffic, dust and a limited level of noise, the character of this particular rural site is already impacted. Taking into account the mitigation measures proposed we agree that the proposed quarrying activity will not a significantly greater impact compared to the racecourse on rural character.
- 306 We find this largely because the quarrying activity will not be continuous. Staging will be utilised so that at any one time only 2ha will be utilised for the quarrying activity.

Summary of Landscape, Rural Character and Visual Effects

- 307 For the reasons traversed above we reach the finding that the actual and potential effects of the quarrying activity, including having close regard to the proposed conditions, on landscape, rural character and visual impacts would be no more than minor.

(f) Actual and Potential Effects of the Diversion of Floodwater

- 308 The positioning of the acoustic bunds at the western and eastern boundaries of the quarry site will be located within the flow path of any flood water in the event of a breakout from the Ashley River.
- 309 Mr Throssell for the Applicant provided flood modelling of the potential effects caused primarily by the bund proposed at the west end of the quarry diverting floodwater in the event of such a flood. As part of the design of this bund the Applicant proposed to construct a 60m long channel immediately west of the western bund to provide additional flow conveyance capacity along one of the key flow paths. Mr Brown, owner of Rangiora Eco Holiday Park camping ground, located at Lehman's Road, raised particular concerns with us in relation to possible risks that the proposed 60m long channel might cause in relation to diversion and retention of any diverted floodwater.
- 310 Originally there were some issues identified by review of the Applicant's flood modelling. The modelling was revised with the correct roughness coefficient. Results showed that floodwaters would not backup behind the western bund as previously shown. Floodwaters, if any, would instead be diverted along the major flow path that already exists through the Eco Holiday Park and along the southern boundary of the racecourse. The proposed excavated channel would increase the capacity of the flow path and reduce water levels to the west of the site.
- 311 The Applicant produced maps showing that flood levels decrease west of the site and east of the site in all events modelled. This included all properties along Lehman's Road including the Eco Holiday Park. Areas of increased flood depth were located within the racecourse site, particularly behind the eastern bund, and on land within the Transpower corridor.
- 312 The Applicant's modelling showed that for some properties located along West Belt in a 100-year return flooding event there would be a small increase in flooding. In a 200 and 500-year return event some properties on West Belt showed no increase. In all scenarios modelled the Applicant stated that floodwaters do not encroach on dwellings.
- 313 In relation to flood duration the Applicant contended that flood duration will be unaffected by the bunds as the drainage of the deflected floodwaters would occur via the attenuation channel.
- 314 Mr Simpson from the Waimakariri District Council provided specialist advice on this issue, noting that the modelling approach was considered appropriate and that the modelling results suggest that the predicted effects of the activity are likely to be minor. He also considered that the duration of flooding would not significantly change as a result of the proposed acoustic bunds. Mr Simpson did point out that the modelling did not include the effects of stockpiles on flood water flows.
- 315 Mr Simpson agreed with Mr Throssell for the Applicant, in particular his conclusion that the potential effects of the proposed acoustic bunds and conveyance channel on flood depth and flood hazard are less than minor.
- 316 Based on Mr Simpson's specialist advice, Ms Dawson considered that the effects of any increase in flood depth would be acceptable. She noted the only location where potential adverse effects could impact on a dwelling structure is at 335 West Belt. She considered, given the likelihood of these events occurring during the lifespan of the quarry and the predicted increase in flood depths, that the effects were acceptable. Mr Simpson also made some recommendations for consent

conditions and Ms Dawson was of the view that, provided those conditions were adhered to, the effects of diverting floodwater would be minimal.

- 317 We agree with the specialist evidence produced by Mr Simpson and Mr Throssell and the assessment of effects in relation to diversion of floodwater provided by Ms Dawson.
- 318 While a little out of sequence, we observe that Ms Dawson provided her views relating to the relevant objectives and policies in terms of flood issues of the CRPS and the WDP which informed her overall assessment.
- 319 In particular she noted the CRPS seeks to avoid new development of land which increases the risk of natural hazards to people, property and infrastructure, or where avoidance is not possible, mitigation measures should be required to minimise risks. She noted the WDP provides guidance on assessing the potential impacts of flooding. Specifically, policy 8.2.1.36 to avoid floodwaters entering residential, commercial and industrial buildings. Policy 8.2.1.46 seeks to avoid, remedy, or mitigate the adverse effects of activities that impede or redirect the movement of floodwater on the site and/or exacerbate flood risk.
- 320 Based on the assessment of effects earlier referred to, Ms Dawson expressed the view that having regard to proposed conditions of consent and the predicted increase in flood risks, the proposal is consistent with the objective and policy direction contained and expressed within the CRPS and the WDP. We agree.

Summary of the Effects of Floodwater Diversion

- 321 In summary we consider that provided the applicant complies with the proposed conditions as amended by Mr Simpson then the effects of diverting floodwater would be minimal.

(g) Actual and Potential Effects on Surface Water Quality and Ecosystems

- 322 The proposed activities have the potential to adversely affect surface water quality and ecosystems in the event that sediment laden run-off enters water bodies or contaminants in groundwater enter surface water.
- 323 We note that effects on surface water quality arising from discharges from the site and in relation to the use of water for dust suppression were raised in submissions.
- 324 The discharge permit being sought is for the discharge of any contaminants that could be present in the VENM. We address that point elsewhere.
- 325 Specifically, the applicant is not seeking consent to authorise any discharge of stormwater or construction phase stormwater. Ms Dawson in her report considered that there will not be any discharge of stormwater or construction phase stormwater. She concluded that it was unlikely that there will be run-off that meets the CLWRP definitions of stormwater or construction phase stormwater. She also considered that given the drainage of the site as excavations will occur below ground level and given the flat topography any precipitation will infiltrate through the ground surface and will not be channelled, diverted or accelerated by human action. We agree with this assessment.
- 326 We note that the applicant has provided details of erosion and sediment control in the quarry backfilling management plan. The applicant also proposes to manage the site to avoid any run-off. We accept that there would be no sedimentation effects on waterways surrounding the site.

327 The applicant assessed the potential effects of contaminants entering surface-waterbodies via groundwater. The assessment notes that it is expected groundwater will discharge into a stream to the south-east of the site. The closest spring is some 2.8km from the site. Ms Kreleger stated that due to the location of the site in relation to the Ashley River/Rakahuri it is unlikely that there would be any significant effects on water levels or water quality in the river. Ms Kreleger also identified the Taranaki stream catchment which is about 2km from the site. She did not expect any significant effects on water quality in the stream.

328 For all of the above reasons we agree with the assessments and conclude that the potential adverse effects on surface water quality would be avoided.

(h) Actual and Potential Effects on Soil and Soil Resources

329 Policy 4.1.1.6 of the Waimakariri District Plan seeks to protect versatile soils to safeguard their life supporting capacity and promote their availability for future uses. However, in this case the site does not contain versatile soils. Also given the current developments on the site it is highly unlikely to be used for future rural production activities. Accordingly, the potential impact of removing soils from the site is seen as low.

330 In any event we note the Applicant is proposing to strip and stockpile topsoil for use during site rehabilitation. The removal of, storing and then redistribution of topsoil could have an impact on soil quality. However, overall we conclude the effects on soil quality, particularly given the steps the Applicant proposes to take, will be minimal.

331 However, we do have concerns in relation to the management of potential soil contamination on the site arising from the use of VENM which we address elsewhere within this decision.

(i) Actual and Potential Effects on Electricity Infrastructure

332 In describing the site, we noted the presence of the Islington-Kikiwa B 220 kVA high voltage electricity transmission line. Notably the proposed eastern bund is located approximately 20 m from Transpower Tower 0071. Within the application materials the Applicant states that it will adhere to the New Zealand electrical code of practice for electrical safe distances (NZECP34:2001).

333 Ms Dawson identified some District Plan rules controlling the distance of earthworks from any support structure foundation. She noted that the conditions proposed by the Applicant seek to prevent excavation occurring within 50 m of Transpower's transmission lines. She noted and accepted the Applicant's contention that the discharge of dust would not create any dust hazard or nuisance to the transmission lines.

334 She was of the view that the Applicant's proposal is compliant with District Plan requirements in respect of Transpower's infrastructure and she was satisfied, as we are, that the Applicant's proposed conditions would manage risks such as they are to the infrastructure.

335 For the reasons she advances in her S42A report, we agree with Ms Dawson's finding that the actual and potential effects of the proposal on electricity infrastructure would be no more than minor.

(j) Actual and Potential Effects on Ngai Tahu Cultural Values

- 336 Section 3.8 of the Applicant's AEE assessed the potential effects of the proposal on Ngai Tahu cultural values. That assessment referenced the Mahaanui Iwi Management Plan (MIMP).
- 337 We were advised that both CRC and WDC had each approached Mahaanui Kurataiao (MKT) for advice and response. Effectively the response was that the proposal was neither consistent nor inconsistent with the relevant provisions of the MIMP.
- 338 It was noted that although the site is located within a drinking water protection zone, it is a significant distance from Tuahiwi and would not affect the bore from which water is supplied to the Marae.
- 339 It was further noted that quarrying activities can have significant effects on cultural values. Thus it was considered important that strict erosion and sediment control measures are in place and any machinery spillages are managed effectively. Also, an accidental discovery protocol was recommended along with rehabilitation being undertaken utilising indigenous vegetation.
- 340 Ms Dawson within her section 42A report undertook an assessment of the relevant provisions of the MIMP. We adopt that assessment and its outcome.
- 341 Ms Dawson was of the view that the potential effects on Ngai Tahu cultural values may be no more than minor. Her assessment was qualified because she considered there were issues arising from the Applicant's clean fill waste acceptance protocols and the proposal gave rise to risks to water quality from on-site soil contamination and lacked a robust groundwater monitoring program.
- 342 If those matters were addressed, Ms Dawson was of the view that the potential cultural effects of the proposal could be acceptable. We agree with that assessment.

(k) Positive Effects

- 343 The applicant identified a number of positive effects of the proposal being:
- (a) support for users of the racecourse, including the owners and other clubs and organisations that use its facilities;
 - (b) security of gravel supply in the district and offsetting of traffic and extraction effects that might occur elsewhere;
 - (c) reducing the need for gravel extraction from rivers; and
 - (d) allowing cost-effective processing at Cones Road in close proximity to the site.
- 344 We agree that the above matters are positive effects of the proposal and we have taken these positive effects into consideration in reaching our decision.

6. RELEVANT OBJECTIVES AND POLICIES

- 345 Similar to our approach with assessing actual and potential effects we will concentrate our consideration on those objectives and policies that have critical significance in our decision making.

- 346 Adele Dawson within her section 42A report between pages 99 and 138 identifies all of the objectives and policies within a range of planning instruments relevant to this proposal. She undertakes a comprehensive assessment of the proposal against those relevant objectives and policies. So given the findings we have made in relation to effects relating to dust, transport, noise and vibration, landscape, rural character and visual effects, floodwater, soils, electricity infrastructure and cultural values and having regard to the assessment of the objectives and policies relating to those effects undertaken by Adele Dawson within her principal section 42A report¹ we do not intend to detail our consideration of them rather adopt her finding that the Proposal is consistent with those objectives and policies related to those effects.
- 347 However, we have considered the provisions of The National Policy Statement on Electricity Transmission, 2008, the National Environmental Standards for Air Quality Regulations 2004 in particular Regulation 17, the Canterbury Regional Policy Statement, the Canterbury Land and Water Regional Plan, the Canterbury Air Regional Plan, and the Waimakariri District Plan.
- 348 We agree with and accordingly adopt her assessment of the proposal, particularly in relation to the effects identified in paragraph 346 above against those objectives and policies. When considering those effects and the relevant parts of the proposal she concluded in those respects the proposal was consistent with the relevant objectives and policies from the relevant plans applying to those matters. We agree. It is the Freshwater provisions of the relevant planning documents that are key focus.

Freshwater objectives and policies

- 349 The National Policy Statement for Freshwater Management 2020 sits atop the planning hierarchy. Objective 1 has 3 priorities. The first of which is to ensure that natural and physical resources are managed in a way that prioritises the health and well-being of waterbodies and freshwater ecosystems. The second priority is the health needs of people (such as provision of drinking water) and the third is the ability of people and communities to provide for their social, economic and cultural well-being, now and in the future.
- 350 Given the potential water quality effects we have detailed above, due to the risk of contaminants being present and undetected in the VENM and the Applicant's ability to appropriately manage the excavation depth relevant to groundwater levels, we consider there is a risk that contaminants would enter into the groundwater system and potentially adversely impact downgradient drinking water supplies.
- 351 We are of course alive to the conditions intended to avoid or at least minimise risk in relation to contaminants affecting freshwater and drinking water. We have carefully considered those conditions. However, we have concerns as to their adequacy to appropriately manage the natural and physical groundwater resource so as to achieve the priorities set out in Objective 1 of the NPSFM and from the view that objective will not be met.

¹ See Pages 101,103-138.

- 352 Policy 3 NPSFM provides that freshwater should be managed in an integrated way that considers the effects of the use and development of land on a whole of catchment basis, including the effects on receiving environments.
- 353 In our view the Applicant's proposal has the potential to adversely affect freshwater. While this potential risk has been assessed by the Applicant we consider that overall, that assessment is not sufficiently robust. In addition, we have concerns that the relevant conditions promoted by the Applicant lack a sufficient level of certainty to appropriately address the potential to adversely affect freshwater. We are not satisfied this policy will be met.
- 354 The National Environment Standard for Sources of Human Drinking Water Regulations 2007 particularly regulation 7 and 8 need be considered. The WDC community supply wells located in the area are part of the Rangiora community supply network which serves more than 17,000 people. Regulation 7 states that;
- “A Regional Council must not grant a water permit or discharge permit for an activity that will occur upstream of an abstraction point where the drinking water concerned meets the health quality criteria if the activity is likely to-
- (a) introduce or increase the concentration of any determinants in the drinking water, so that, after existing treatment, it no longer meets the healthy quality criteria; or
 - (b) introduce or increase the concentration of any aesthetic determinants in the drinking water so that, after existing treatment, it contains aesthetic determinants at values exceeding the guideline values”.
- 355 Based on the expert opinions we have referred to above primarily from Ms Kreleger, Dr Rutter and Mr Simpson we remain unsatisfied that the proposal including conditions would not increase the concentration of contaminants to the extent that the water quality no longer met the NZDWS health criteria or aesthetic determinant guideline values.
- 356 Regulation 12 of the NES is also relevant as it applies to registered drinking water supplies that provide 25 or more people with drinking water for not less than 60 days each calendar year.
- 357 We were advised that the Rangiora Eco Holiday Park provides water for between 25 and 100 people and is subject to Regulation 12. However, we were advised the Eco Holiday Park is up-gradient and therefore unlikely to be affected.
- 358 Again, based on the expert evidence we have received we remain concerned that there could be adverse effects on drinking water supplies. These concerns arise from the proposed clean fill management practices and the groundwater quality monitoring proposed by the Applicant. We are not satisfied that they were sufficiently robust and detailed to address these matters that Regulation 12 gives rise to.
- 359 The Canterbury Regional Policy Statement (RPS) within Chapter 7 prioritises the life supporting capacity of freshwater ecosystems and actual or reasonably foreseeable requirements for community water supplies.
- 360 Relevant is objective 7.2.1. While we accept the Applicant proposed a number of operational practices and monitoring to protect groundwater quality, we remained unconvinced that the relevant conditions of consent were sufficiently refined to ensure groundwater quality is maintained and that safe drinking water is available.

- 361 Essentially, we were not satisfied with the proposed ground water quality monitoring and remediation measures, nor were we satisfied that the controls related to VENM were sufficient to ensure that contaminated material inadvertently used as backfill at the quarry site did not cause significant adverse effects. We were not satisfied this objective would be met.
- 362 Policy 7.3.2 provides for a precautionary approach to the allocation of water for abstraction, the damming or diversion of water, or the intensification of land uses for discharge of contaminants, in circumstances where the effects of those activities on freshwater bodies, singularly or cumulatively are unknown or uncertain. Given the Applicant's proposal involves excavating below the highest groundwater level, which would be a new development for a quarry operation, we consider that this policy is directly engaged. Also given this excavation depth the risk that the VENM used as clean fill was not free of contaminants engaged a precautionary approach.
- 363 In our view the proposed conditions did not satisfy the intent of policy 7.3.2. We have determined that there is a definite risk that contamination could arise from deposition of non-compliant VENM or the presence of exposed groundwater in the quarry pit. Further, the proposed conditions in substantial part rely on monitoring the quality of groundwater affected by the discharge. If monitoring demonstrated that the discharge adversely affected groundwater quality then the harm or adverse effect could have already occurred and remediation could require considerable time an expense. We consider this is not consistent with a precautionary approach.
- 364 In relation to ascertaining whether or not the VENM for backfilling contained contaminants we are not satisfied that the proposed conditions included a precautionary approach appropriate to the nature and character of the receiving environment and sensitivities, the level of risk and finally the consequences for the environment including people and communities if water quality contamination occurred.
- 365 There are other relevant objectives within chapter 7 which are referred to and discussed in Adele Dawson's section 42A report. We have highlighted the objectives and policies that we consider the proposal, inclusive of proposed conditions, remains inconsistent with.
- 366 The Canterbury Land and Water Regional Plan (CLWRP) at objective 3.8A requires high quality freshwater to be available to meet the actual and reasonably foreseeable needs for community drinking water supplies. We are not satisfied this objective would be met.
- 367 While we accept the Applicant has sought a discharge permit associated with the deposition of clean fill, the nature of the discharge is dependent upon the quality of that fill material. The Applicant considers that if VENM is utilised in the manner proposed there will not be any associated discharge of contaminants.
- 368 However, our concern is that the Applicant's proposed conditions in relation to ensuring that the VENM does not contain contaminants are not sufficiently robust. This is particularly so having regard to the frequency with which detailed testing of the VENM is proposed and the high level of dependence upon visual inspections. So we remain concerned that material that does not meet the waste acceptance criteria could be deposited. As well from an operational point of view we are concerned that the Applicant may not be able to adequately respond to fluctuating groundwater levels with sufficient speed.

- 369 We also consider that policy 4.5, because it prioritises management of water for community drinking water supplies over other economic activities, provides for adequate protection of drinking water supplies as a critical issue in this case. Because the site is located within community supply protection zones and in close proximity to private bores we remain concerned that the potential effects of the proposal on drinking water supplies would not satisfy this protective policy.
- 370 Policy 4.23 requires that any water source for drinking water be protected from any discharge of contaminants that may have any actual or potential adverse effects on the quality of the drinking water supply including its taste, clarity and smell. Community drinking water supplies are to be protected so they align with the CWMS drinking-water targets and meet the drinking-water standards for New Zealand.
- 371 The site is located within the community drinking water protection zone of several community supply wells. As noted earlier we remain unconvinced about the Applicant's clean fill management practices and the robustness of the proposed groundwater monitoring program. For those reasons we are not satisfied the intent of this policy would be met.
- 372 We note that policy 4.94 does enable the extraction of gravel from land provided adverse effects on groundwater quality are minimised and remediation is undertaken to minimise any ongoing risk of groundwater contamination. In this instance we were not satisfied that the applicant's proposals appropriately minimised adverse effects on groundwater quality so as to satisfy this policy.
- 373 The Waimakariri District Plan -Section 3 Water includes objective 3.3.1 to maintain and enhance the water quality of confined and unconfined groundwater aquifers.
- 374 There is a related policy 3.3.1.1 that seeks to, "avoid or mitigate the adverse effects of the use, development and protection of land on the water quality of confined and unconfined groundwater aquifers". The site is located over an unconfined aquifer. As we have already stated we consider that there is a risk to groundwater quality based on the current proposal inclusive of conditions. In particular we remain concerned that the waste acceptance and auditing procedures are insufficiently robust to avoid or mitigate the adverse effects on water quality on confined and unconfined groundwater aquifers. So we reach the view the proposal including conditions is inconsistent with this policy.

7. PART 2 MATTERS

- 375 Legal counsel who appeared were not agreed as to whether or not it was necessary to have regard to Part 2 in considering these applications. Some submitters considered it was necessary to have regard to Part 2 in considering these applications because the relevant planning documents have been prepared prior to the higher order planning documents.
- 376 Others argued the fact that relevant planning documents were prepared prior to higher order planning documents does not require a Part 2 consideration. Rather those higher order planning documents need be carefully considered. We support the latter view.
- 377 However, given our findings above particularly that we consider the proposal is inconsistent with the relevant planning directions in relation primarily to freshwater, it is clear to us consent should be refused.
- 378 In the event our approach to Part 2 is wrong we record that given we consider the proposed conditions, particularly as they relate to freshwater, are not appropriate then we consider the proposal would:
- (a) not enable people and the community in Rangiora to provide for their social, economic and cultural well-being and for their health and safety;
 - (b) undermined the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations of residents of Rangiora;
 - (c) fail to safeguard the life-supporting capacity of air, water, soils, and ecosystems; and
 - (d) fail to avoid, remedy or mitigate the various adverse effects we have described earlier on the environment.

8. OTHER RELEVANT MATTERS

- 379 Ms Dawson drew our attention to the Iwi Management Plan 2013 and the Canterbury Regional Gravel Management Strategy as possibilities to consider as other matters.
- 380 We have already considered effects on cultural values. We agree with Ms Dawson that the applicant proposes to undertake the proposal in a manner which is consistent with that management plan.
- 381 The River Gravel Management Strategy is focused more so on river extraction rather than land-based quarry operations. We did not consider it helpful to consider that strategy in any detail.

9. SECTION 105 MATTERS

- 382 In addition to the matters set out in section 104 (1), section 105 (1) requires us to have regard to the following matters for applications that would contravene section 15 or section 15 B of the RMA:
- (a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects;

- (b) the applicant's reasons for the proposed choice; and
- (c) any possible alternative methods of discharge including discharge into any other receiving environment.

383 There are two discharges required to be assessed in accordance with section 105. They are the discharge permit to discharge contaminants into air and the discharge permit to discharge contaminants to land where it may enter water. In concentrating on the second discharge the applicant has not provided any evidence or specifically commented on alternatives to the potential discharges associated with the use of VENM.

384 We have found that avoiding or preventing potential discharge of contaminants relies totally on the operational and management procedures, particularly in relation to ensuring VENM is not contaminated. This is particularly important given the nature of the discharge that may arise and the sensitivity of the receiving environment to adverse effects.

385 We also consider that in terms of alternative methods of discharge into any other receiving environment, this invites consideration of alternative sites. We have already commented earlier we do not consider that the applicant's assessment and/or consideration of alternative sites for the quarry has in this case been appropriate.

10. SECTION 107 MATTERS- RESTRICTIONS ON GRANT OF CERTAIN DISCHARGE PERMITS

386 Under section 107(1) of the RMA we are not to grant a resource consent for the discharge of a contaminant into water, or on or into land if after reasonable mixing the discharge is likely to give rise in the receiving waters to relevantly:

- the production of conspicuous oil or grease films, scums, foams, or floatable or suspended materials;
- any conspicuous change in the colour or visual clarity;
- any emission of objectionable odour;
- the rendering of fresh water unsuitable for consumption by farm animals;
- any significant adverse effects on aquatic life.

387 While our evaluation of the evidence indicates that the proposal including conditions could potentially cause contamination of groundwater so that community drinking water supplies are affected, the evidence is that the discharge is not likely to give rise to the specific effects listed above.

11. ALTERNATIVE SITES

388 The Applicant's case was presented on the basis that an assessment of alternate locations and methods is not required because the proposal does not cross the threshold of significant adverse effects.²

² RMA, schedule 4, clause 6(1)(a).

- 389 We were not satisfied on that point for the reasons advanced above. It is our view that an assessment of alternate locations and methods should have been more rigorously explored by the Applicant.
- 390 Even if the Applicant's proposition was correct, which we do not agree with, given that applications for discharge permits have been made it is necessary to consider any possible alternative methods of discharge, including discharge into other receiving environments.³
- 391 Mr Taggart for the Applicant provided evidence as to the nature of investigations to consider alternate sites for the proposal. Distance between gravel sources, processing sites, and the ultimate market for gravel resources was a critical issue. Essentially, it was his evidence that for the activity to be economical the gravel resource would need to be within 10 km of the Cones Road yard.
- 392 We noted that the Applicant's existing Ashley River source of gravel is located 10 km away from the Cones Road yard. Mr Taggart detailed current constraints relating to extraction of river gravels. He did not detail other land-based sources other than one site located near the Rangiora airport discounted due to bird strike issues.
- 393 We were surprised by the lack of information and detail relating to land-based alternatives. After all gravel is a relatively common resource available throughout the Canterbury Plains. We doubted gravel availability would be any different for Rangiora and its surrounds.
- 394 In evaluating Mr Taggart's evidence, we arrived at the conclusion that proximity to the Cones Road yard dominated and limited his investigations leading him to prefer the proposed quarry site for practical and economic reasons. A more comprehensive consideration of alternatives was not undertaken when we think it should have been.
- 395 Many submitters were critical of the Applicant's very limited investigation of alternative sites.
- 396 The Applicant in its reply contended that Mr Taggart's evidence provided us with sufficient information as to alternatives to the extent that it is relevant. Moreover, the Applicant submitted the issues of alternatives does not weigh against the grant of consent. However, our view is different.
- 397 In our view the consideration of alternatives needed to be much more comprehensive. In our view the Applicant has failed to place sufficient weight on the sensitivity of the potential receiving environment and the consequent need to consider alternatives.
- 398 Even if we accepted that an adverse event such as contamination of drinking water supplies might with proffered mitigation be of low probability, the proximity to sensitive uses such as the protected community water supply zone coupled with the significance of contamination of the water supply means we conclude that a rigorous consideration of alternatives should have been undertaken by the applicant.

³ RMA, schedule 4, clause 6(1)(d)(ii).

12. DECISION

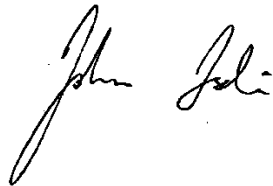
- 399 For all of the above reasons and pursuant to sections 104, 104B, 105 and 107 and if required subject to Part 2 of the RMA we refuse the applications made by Taggart Earthmoving Ltd for resource consents to establish, maintain, operate and rehabilitate the quarry at 309 West Belt, Rangiora.
- 400 Primarily we have concluded that the risks and potential risks to groundwater contamination and contamination of drinking water supplies down-gradient of the site are unacceptable.
- 401 If these risks eventuate, we are concerned about the consequences, particularly for the Rangiora backup community supply options. We are aware that reacting or responding to groundwater quality degradation may be extremely difficult and disruptive to those affected. Any contamination would likely remove the backup community drinking water supply for Rangiora for an extended period of time.
- 402 We find that the focus of the proposal and conditions should be strongly on prevention of contamination of groundwater in this highly sensitive environment.
- 403 We are not satisfied that the proposed waste acceptance protocols are appropriate or adequate to ensure that only VENM free of any contaminant would be deposited as backfill at the site. Deposition of such material where it can be inundated with groundwater over time as levels fluctuate has potential to result in leaching of contaminants into the shallow groundwater resource used for drinking water supply. We are mindful that such circumstance could exist both during the operation of the quarry and for some time following its rehabilitation. Also, if such contamination occurs remediation works would be difficult and could involve considerable time and expense.
- 404 We are not satisfied that the groundwater quality monitoring and remediation measures proposed are sufficient to protect drinking water supplies.
- 405 Further, we consider that the applicant has not clearly demonstrated the ability to adequately manage excavation depth relative to real-time groundwater levels at the site. We consider that insufficient information has been provided in relation to forecasting of groundwater levels at the site and the management of activities in response to those levels. We heard from the experts for the councils that a water level forecasting model is key with respect to managing the proposed operation and reducing risks to groundwater. We find that a water level forecasting model should have been provided for consideration as part of the application process.
- 406 We have found that the applicants' proposed measures and conditions to respond to groundwater level rise are somewhat onerous, with the need for backfilling then subsequent removal of VENM material before further gravel could be extracted. We determine that the risk of non-compliance with such complex conditions is real and we find, based on the information provided, that it is not clear those conditions could be physically or technically met.
- 407 Bearing in mind the insufficiency of evidence supporting the Applicant's view that exposed groundwater in the quarry pit could be prevented at all times, we find that there is a risk of microbial contamination of drinking water supplies. We consider this risk to be low but with high potential consequences for drinking water supplies.
- 408 Given our conclusions regarding the significance of potential adverse effects on drinking water supplies, we determine that a substantially more comprehensive assessment of alternative sites should have been undertaken by the Applicant.

- 409 We are not satisfied that the evidence we have considered sufficiently demonstrates the proposal, inclusive of conditions, would safeguard the life-supporting capacity of water and that adverse effects on groundwater and drinking water would be avoided, remedied or mitigated to the extent required to support the grant of consent for this proposal.
- 410 We have found, after considering the relevant objectives and policies of the planning instruments, that granting consent to this proposal would be inconsistent with those objectives and policies particularly those that seek to protect and safeguard water and drinking water.

Dated Friday 9 July 2021



Paul Rogers
Independent Commissioner – Chair –



John Iseli
Independent Commissioner