Otago Regional Council

Section 42A Recommending Report

Water Permit Application
Discharge Permit Applications to land, water, and air
Land Use Consent for a Bore
Cromwell Certified Concrete Ltd

The recommendation in the report represents the opinion of the writers and it is not binding on the Hearing Commissioner. The report is evidence and will be considered along with any other evidence that the Hearing Commissioner will hear.

Duncan Whyte
Consultant Planner

23/11/2021

Executive Summary of Recommendation

Cromwell Certified Concrete Ltd has applied for resource consents relating to an existing quarry and its expansion. The quarry has been operating on the site since 1995. Resource consents were granted by ORC in 2016. It is these consents (water permits to take and use groundwater, and to discharge water to land following gravel washing) that are to be replaced and new consents are sought to discharge contaminants to air from extraction and processing activities and a depth of excavation that will expose groundwater (create a bore). A term of 25 years is sought, except that the term for the bore is sought to be unlimited. The key issues relate to:

- A rate of groundwater take with potential for bore interference effects;
- Groundwater quality effects; and
- Dust effects on sensitive receptors.

After assessing the actual and potential effects of the applications, considering submissions, and considering all of the matters in section 104 of the Resource Management Act 1991, the recommendation of the consultant planner is to grant in part the application for a duration of 25 years subject to the recommended conditions of consent to facilitate quarrying and processing activities on Lots 5 and 8 DP 301379 (but not Lot 3 DP 301379).

2. Report Author

My full name is Duncan Graham Whyte and I am a Principal Planner with 4Sight Consulting Ltd.

I was appointed by ORC on 6 July 2021 to assist ORC with the processing of this application and preparing the section 42A report as a consultant planner. I have more than 25 years professional experience as a planner in Australia and New Zealand, including experience processing water permit applications for taking and damming water for ORC from 2002 to 2004. I am familiar with s42A reporting requirements based on review and preparation of reports for regional and district councils having acted in similar roles in a number of locations across New Zealand.

I have also been appointed by CODC to prepare the s42A report for the land use consent for this quarry that is to be heard jointly with the ORC applications.

I am a full member of the New Zealand Planning Institute with a Bachelor of Arts (Honours) from the University of Canterbury and a Master of Regional and Resource Planning from the University of Otago. I am also a member of the Resource Management Law Association.

I discussed the application with the Sarah Davidson, Senior Consents Officer, prior to her departure from the ORC. I subsequently undertook a site visit on Tuesday, 20 July 2021.

While this matter is not before the Environment Court, I have read and agree to comply with the Code of Conduct for Expert Witnesses (Environment Court Practice Note 2014). I confirm this evidence is within my area of expertise, except where I state I am relying on facts or information provided by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

OTAGO REGIONAL COUNCIL
SECTION 42A REPORT

ID Ref:	**A1568039**
Application No(s):	**RM20.360.01 to RM20.360.04**
Prepared For:	**Hearing Commissioner**
Prepared By:	**Duncan Whyte**
Date:	**23 November 2021**

Subject: **Section 42A Recommending Report – the applications relate to continuing works at an existing quarry and its expansion by Cromwell Certified Concrete Ltd involving discharges to land, water, air, taking and using water, and a land use consent for a bore as a consequence of gravel extraction to expose groundwater across a large proportion of the site.**

1. Purpose

This report has been prepared under Section 42A of the Resource Management Act 1991 (RMA) to assist in the hearing of the application/s for resource consent made by Cromwell Certified Concrete Ltd. Section 42A enables local authorities to require the preparation of a report on an application for resource consent and allows the consent authority to consider the report at any hearing. The purpose of the report is to assist the Hearing Panel in making a decision on the applications.

The report assesses the application in accordance with Sections 104 and 104B of the Resource Management Act 1991 and makes a recommendation as to whether the application should be granted in part for activities on Lot 5 and Lot 8 DP301379 (and not Lot 3 DP 301379), and a recommendation on the duration of the consent and appropriate conditions.

This report contains the recommendations of the Consultant Planner and is not a decision on the application/s. The recommendations of the report are not binding on the Hearing Commissioners. The report is evidence and will be considered along with any other evidence that the Hearing Commissioners will hear.

2. Summary of the Application

2.1 Overview

Applicant:	**Cromwell Certified Concrete Ltd**
Applicant's agent:	**Landpro Ltd**
Site address or location:	1248 Luggate-Cromwell Road
Legal description at point of take:	Lot 3 DP 301379, Lot 5 DP 301379 and Lot 8 DP 301379
Legal description at point of use:	Lot 3 DP 301379, Lot 5 DP 301379 and Lot 8 DP 301379
Map reference(s) of point of take:	NZTM 2000: E1305460 N 5017181

Consents sought:

- RM20.360.01 Water permit to take and use groundwater for the purpose of gravel washing and dust suppression
- RM20.360.02 Discharge Permit to discharge contaminants to land to discharge water to land for the purpose of gravel washing
- RM20.360.03 Discharge Permit to discharge contaminants to air for the purpose of operating a quarry
- RM20.360.04 Land use consent to construct a bore for the purpose of excavating a quarry pit to a depth that intercepts groundwater

Purpose of take:	For the purpose of gravel washing and dust suppression and the operation of Amisfield Quarry.
Deemed permits:	Not applicable.
Information requested:	Information requests were sent on 12 November 2020 (groundwater pumping test, breakdown of consumptive uses, Amisfield Burn effects, Lake Dunstan permitted takes) and 21 January 2021 (dust effects including assessment of neighbouring horticultural uses and dust management plan, and meteorological data).
Notification decision:	The application was limited notified on, 27 April 2021, 11 May 2021, and 11 June 2021. Renotification (11 May 2021) occurred to correct the details for affected parties, and the additional notification (11 June 2021) was to notify the bore owner (Amisfield Estate Society Incorporated) and users of bore G41/0005. Written approval was provided by Lindsay Moore, but this was withdrawn on 8 June 2021.
Submissions:	Total submissions received by due date: 16 - in support: 0 - in opposition: 15 - neutral: 1 **Number of late submissions:** 1 (Manukau Fifty Ltd) **Wishing to be heard:** Yes
Site visit:	I undertook a site visit on Tuesday, 20 July 2021 to observe the existing quarry and the proposed expansion site. Sarah Davidson, Senior Consents Officer, completed her site visit on 9 December 2020.
Key Issues:	It is considered that the key issues with this application are: - 25 year consent duration (water permit, discharge permit to air, discharge permit to land); - Unlimited consent duration (bore); - Increased rate of groundwater take with bore interference effects; - Groundwater quality effects; and

- Discharge of dust.

2.2 Description of Application

The applicant, Cromwell Certified Concrete Limited (CCCL) currently operates a quarry on the subject site that extracts aggregate. The quarry has been operating on site since 1995. Consents were granted by ORC in 2016. It is these consents that are to be replaced and new consents are also sought. A 20 year consent duration was sought in the application as lodged, but the duration specified in the draft conditions provided by the applicant on 10 November 2021 is for a 25 year consent duration (except that the bore was sought based on an unlimited duration).

The applicant has purchased adjoining land to the north of the existing quarry with the intention of expanding the quarry onto this land in time. The applicant advises the available consented gravel resource in the existing quarry is sufficient to meet local demand for the next five to six years. Projected demand is such that the applicant considers it is necessary to expand the quarry. As a consequence, the applicant is seeking to replace the existing consents RM16.108.01 and RM16.108.02 and include additional consents in relation to the construction of a bore and the discharge of contaminants to air in relation to the quarry expansion. The extension of the quarry footprint is not a matter that is consented by ORC, instead this is a District Council matter.

The quarry currently operates with a pre-strip, active face and backfill configuration with each strip being approximately 50 metres wide. Overburden is used to backfill worked areas of the quarry. Gravel is extracted by traditional dump truck and shovel techniques. Dump trucks transport unprocessed gravel from the active face to the fixed plant identified in Appendix 1 of the application. Processed aggregate is stockpiled in areas within the existing quarry and stored accordingly to different grades of processed gravel. Areas of the quarry which have been worked are backfilled with overburden. Figure's 1 and 2 illustrate an active working face and the screening and washing plant with stockpiled washed aggregate.

2.2.1 Groundwater take

Under RM16.108.01 the applicant is authorised to abstract groundwater at a maximum rate of 46L/s from bores G41/0127 and G41/0456 for use in processing aggregate and supressing dust. The applicant proposes to increase this take to 70L/s. **Table 1** summarises the proposed groundwater take limits. Water is abstracted and will continue to be abstracted from the Pisa Groundwater Management Zone.

Table 1: Existing and proposed groundwater take limits

Rate	Current water take limits	Proposed water take limits
Instantaneous rate (L/s)	46	70
Daily rate (m^3/day)	1,620	3,024
Monthly rate (m^3/month)	50,220	93,774
Annual rate (m^3/year)	453,600	846,720

Source: Application

Water abstracted is utilised for washing and screening aggregate and dust mitigation. The location of the washing and screening plants are identified in Appendix 1 of the application. Water from the existing bore is also utilised for potable water. An assessment of the breakdown of water use has

been provided as part of further information received on the 2 December 2020. This is outlined in the following table.

Table 2: Breakdown of water use

Use	Volume (m^3/day)	Percentage of total (%)
Crushing plant	2,768	91.5
Water cart	240 ($20m^3$ x 12 times/day)	8
Irrigation	15	0.5
Potable use/washdown	1 (rounding up)	Negligible
Total	**3,024**	**100**

Source: Application

2.2.2 Discharge to land

The applicant proposes to discharge contaminants to land associated with the washing and screening of aggregate and dust suppression that is currently authorised by RM16.108.02. Due to the increased water take and expansion of quarry, an increase in the discharge of contaminants is sought. The applicant proposes to discharge the same volume of water sought under **Table 1**.

2.2.3 Discharge to air

The applicant proposes to extract 200,000 cubic metres of aggregate a year, which exceeds the 100,000 cubic metres permitted activity provision under Rule 16.3.5.3 of the Regional Plan: Air for Otago (RPA). The dominant air discharge contaminant from quarrying operations will be particulate matter in the form of dust. Products of combustion such as sulphur dioxide (SO_2), nitrogen oxides (NO_x) and carbon monoxide (CO) will also be discharged to air from the operation of machinery and vehicles.

2.2.4 Land use consent - bore

At present the quarry is consented under the land use consent with CODC to excavate to a maximum depth of 15 metres below ground level. The applicant now wants to excavate the gravel resource deeper to a maximum depth of approximately 30 metres below ground level. Given the proposed increase in the depth of excavation, it is likely that groundwater will be intercepted, so the pit acts as a bore. Where groundwater is intercepted, excavation of aggregate will involve the use of a mobile dragline machine. Resource consent is needed for this activity.

Figure 1. Photograph of active working face with load and trucks

Source: Application

Figure 2: Photograph of screening and washing plant with washed aggregate in foreground

Source: Application

The quarry will continue to incorporate the same extraction and processing techniques as existing. Material extracted from the expanded quarry will be transported back to the existing crushing and washing plant. No crushing or washing/screening will occur in the expansion area and this area will be limited to excavation and transportation of material.

Wash water from the crushing and screening plant is directed towards a soakage pond that allows sediment to be filtered as water is discharged via seepage. No additional water management infrastructure as part of the expansion is proposed. Stormwater is directly discharged to ground. **Figure 3** identifies the location of the soakage pond (settling pond) and **Figure 3** illustrates an aerial of the soakage pond in relation to the screening and crushing plant.

Figure 3: Soakage Pond in relation to screening and crushing plant

Source: Otago Maps

2.3 Details of Resource Consents Being Replaced and Sought

The applicant is seeking to replace existing resource consents as outlined in **Table 3**. RM16.108.01 is a water permit that expires on 21 July 2036. This application was lodged with the Council at least six months before the expiry date. RM16.108.02, is a discharge permit which expires on 21 July 2036.

In accordance with Section 124 of the Act, the applicant has obtained continuation rights to operate under Water Permit RM16.108.01 until a decision on this application is made and all appeals are determined.

Table 3: Existing resource consents

Permit No.	Volume Authorised	Type
RM16.108.01	46 L/s	Water permit to take groundwater
RM16.108.02	46 L/s	Discharge permit to discharge water to land for gravel washing

Table 4: Resource consents applied for

Permit No.	Volume/Depth	Type
RM20.360.01	70 L/s	Water permit to take groundwater
RM20.360.02	70 L/s	Discharge permit to discharge water to land for gravel washing
RM20.360.03	200,000m^3/year	Discharge permit to discharge contaminants to air for the purpose of operating a quarry
RM20.360.04	30m depth	Land use consent to construct a bore for the purpose of excavating a quarry pit to a depth that intercepts groundwater

2.4 Compliance History

ORC's Compliance Team have reviewed the application and provided a summary of compliance history. The most recent audit was undertaken in 2016 where the consent holder was graded as compliant. Metering is undertaken as required by RM16.108.01 and all monitoring has been undertaken. Quarterly bore sampling of suspended sediment has been undertaken in accordance with Discharge Permit RM16.108.02.

The compliance team notes that no complaints have been filed in respect of existing quarry operations prior to 7 July 2016. ORC have received complaints on two separate occasions in 2020 raising concerns over dust.

2.5 Application Documents

The applicant has provided the following documentation with the application:

- 23 October 2020 Application lodged
  - Forms
  - AEE
  - Site Plan
  - Record of Titles
  - Transport Assessment
  - Technical Assessment (Dust)
  - Landscape and Visual Assessment
  - Technical Assessment (Noise)

- Technical Assessment (Water Take)
- Technical Assessment (Ecological)
- Affected party approval

- 2 December 2020 Further information response
  - Pumping test comment
  - Breakdown of water use
  - Soakage pit operation and evaporation losses
  - Assessment of effects of flows downstream in Amisfield Burn
  - Permitted activity
  - Other matters
  - Aquifer pump test for G41/0456 provided
- 5 March 2021 Further information response
  - Additional Air Quality Assessment
  - Draft Dust Management Plan
- 10 November 2021 Further information provided
  - Landscape Assessment Peer Review
  - Air Quality Assessment Peer Review
  - Dust Management Plan
  - Record of Titles
  - Economic Impact Assessment
  - Water Quality Analysis of Groundwater
  - Bond Calculation Methodology
  - Amended Site Plan
  - Extraction Plan
  - Cut and Cover for Expansion Land Access Methodology
  - Location and design of sign
  - Draft Conditions
  - Letter from Department of Conservation withdrawing their request to be heard

3. Notification and Submissions

3.1 Notification Decision

Council made the decision to process the application on a limited notified basis under Section 95B of the RMA on 20 April 2021, A1421820. The notice was served on 27 April 2021, and the submission closing date was 28 May 2021. The notice for renotification was served on 11 May 2021, and the submission closing date was 11 June 2021. The notice for additional notification was served on 11 June 2021 and the close of submission period was 18 June 2021 (closed early).

The persons listed in **Table 5** were determined to be adversely affected and were notified.

Table 5: Limited Notification (27 April 2021)

Person	Reasons why they are adversely affected
Lowburn Land Holdings Limited Partnership	This party is the consent holder for 2003.363, that takes and uses groundwater from G41/0222. Maximum interference effects are expected to be greater than 0.2m for an unconfined aquifer.

Person	Reasons why they are adversely affected
Lindsay Allan More	ORC records show the consent holder for G41/0111 is David McTanish. The land use consent (95653) for the bore was consented in 1995 and since this time the property has changed ownership where the bore is located. The bore is located on Lot 3 DP 26218. Interference effects are estimated to be greater than 0.2m. As such Lindsay Allan More (legal land owner) is considered to be an affected party. In addition to this, this person is also the legal owner of 13 Mount Pisa Road (Lot 2 DP 384908) where bore G41/0220 is located, and Lot 1 DP 384908, where bore G41/0321 is located.
Wanaka Road Wine Holdings Ltd	This party is the consent holder of 2010.152.V1, that abstracts water from G41/0220 on Lot 2 DP 384908. Interference drawdown effects are estimated to be greater than 0.2m (6.29m). Wanaka Road Wine Holdings Ltd are deemed to be an affected party.
Manukau Fifty Limited	This party is the consent holder of 2001.831 which abstracts water from bore G41/0238. Drawdown effects are estimated to be greater than 0.2m (1.75m). In addition to this, the vineyard on this property may experience adverse effects being within 100m of the existing quarry. Manukau Fifty Limited are deemed to be an affected party.
Jane Marie Miscisco	This person is the legal landowner of Lot 2 DP 26218, that contains land use consent 2004.853 and bore number G41/0326. Drawdown effects are estimated to be greater than 0.2m.
Felton Park Limited	This party surrendered 2006.036 that abstracts water out of G41/0346. The party may still be abstracting water out of this bore under permitted activity volumes. Drawdown effects are estimated to be greater than 0.2m, and therefore this party is considered affected.
Amisfield Orchard Limited	This company is the legal land owner of Lot 1 DP 508108 that contains bores G41/0346 and G41/0340. Drawdown effects are estimated to be greater than 0.2m. In addition to this, the property is located within 100 metres of the proposed expansion area and may experience adverse dust effects. Amisfield Orchard Limited are considered to be an affected party.
Irrigation and Maintenance Limited	This party is the consent holder of RM14.211.02 that abstracts water from G41/0321. Interference effects are estimated to be greater than 0.2m and therefore this party is considered affected.
Bryson David Clark	This person is the legal landowner of Lots 2 and 7 DP 301379 (1308 Luggate-Cromwell Road) where bore G41/0265 is located. Interference effects are expected to be greater than 0.2m on this bore. In addition to this adverse dust effects on this property are expected to be minor or more than minor due to the proximity of the property to the existing quarry and the property being classified as a sensitive dust receptor. This party is therefore considered to be affected for the reasons outlined.
Malcom James Little	This person is the legal landowner of Lot 2 DP 508108. A residential building platform has been approved on this Lot, and the property is located south of the existing quarry area. Adverse

Person	Reasons why they are adversely affected
	dust effects on this property are expected to be minor or more than minor due to the proximity of the property to the existing quarry and the property being classified as a sensitive dust receptor.
Department of Conservation	A scientific reserve owned by the Department of Conservation is located north of the proposed quarry expansion area. The DoC reserve has been classified as a medium receptor in the Beca Report. Due to the location of the DoC reserve being located within 100 metres of the expansion area and the potential presence of nationally threatened species, the adverse dust effects on the reserve are considered to be minor or more than minor.

The application was re-notified on 11 May 2021 due to incorrect information on ORC's GIS system to the persons listed in **Table 6**.

Table 6: Limited Notification (Re-notification 11 May 2021)

Person	Reasons why they are adversely affected
Bryson and Nicola Clark	Refer above. Additional named added.
Hayden Little Family Trust (CP Trustees Limited, Hayden Little and Malcom Little)	Refer above. Correct owners identified.
Lindsay Allan Moore and Rosemary Sidey	Refer above. Additional name added.
Amisfield Orchard Limited	Refer above.
Lowburn Land Holdings Limited Partnership	Refer above.
Manukau Fifty Limited	Refer above.
Department of Conservation	Refer above.
Amisfield Farm Ltd	Owner of bore G41/0295.
Wanaka Road Wine Holdings Limited	Refer above.
Irrigation and Maintenance Limited	Refer above.
Douglas Cook	Owner of bore G41/0326.
Walnut Ridge Limited	Owner of bore G41/0265.

The application was notified on 11 June 2021 to Amisfield Estate Society Incorporated and users of bore G41/0005 (refer to **Table 7**) when ORC became aware that the GIS system records were incorrect for this bore.

Table 7: Limited Notification (Additional notification 11 June 2021)

Person	Reasons why they are adversely affected
Amisfield Estate Society Incorporated	The Society's bore (G41/0005) is located on the property currently owned by Lindsay Allan Moore and Rosemary Kate Sidey (being 1180 Cromwell Luggate Highway, legally described as Lot 3 DP 26218 held in RT OT18B/214). The bore owner and users were notified by the Otago Regional Council of the applications as an affected party. During the notification period, correspondence was received from an interested party alerting Council that permitted activity takes are being taken from a bore identified on Council's GIS as abandoned and the associated water permit as expired. This bore is located near another bore that has been assessed as having interference effects greater than 0.2m. Council made AESI (and users) an affected party and closed the notification period early.

3.2 Submissions Received

Submissions were received from the submitters listed in **Table 8**.

Table 8: Summary of Submissions

Submitter	Submission Points	Wishes to be heard
Irrigation and Maintenance Limited	Concerns with water and discharge to land	Yes
Douglas Hilton Cook	Concerns with dust, water and land contamination	Yes
Lindsay Allan Moore and Rosemary Kate Sidey	Concerns about noise, dust and back fill being dumped	No
Jane Marie Miscisco	Concerns regarding drinking water , self regulation, extra traffic, dust and noise	Yes
Nicola Jane Clark and Bryson David Clark	Increased rate of groundwater take, adverse effects on water quality and quantity, discharge to land and water, proposed increased discharge of dust and adverse effects on air quality and health (discharge to air)	Yes
Hayden Sinclair Little, Malcolm James Little and CP Trustees Limited being trustees of the Hayden Little Family Trust	Concerns with dust, noise, visual effects, loss of prime soils, water and encroachment of land	Yes
Peter William Laing and Amisfield Bay Vineyard Limited	Concerns with size increase, water contamination	Yes

Submitter	Submission Points	Wishes to be heard
William Norman Labes and Phillipa Jane Labes	Concerns with noise, dust, water and security of site	Yes
Towyn Trust and Lake Terrace Cherries Limited	Concerns with water, dust, noise and remediation	Yes
Stephen Ernest Morris and Olivia Jane Morris	Concerns with water, dust, noise, land use, public safety, land contamination and visual effects	Not stated
Anthony John Agate and Frances Lindsay Agate	Concerns with increased water take, land and water contamination, dust and public safety	No
David Stevens and Lynley Stevens	Concerns with water and land contamination and dust	Yes
Robin Palin Greer and Lois Lorraine Greer	Concerns with water supply contamination	Yes
Amisfield Orchard Limited	Concerns with dust, noise, visual effects, loss of primes soils and water	Yes
Amisfield Estate Society Incorporated	Concerns with increased water take, land and water contamination, dust and public safety	Yes
The Stephen and Louise Family Trust	Concerns with contamination of aquifer for domestic and stock water, depletion of aquifer effect of dust on human health and environment	Yes
Manukau Fifty Ltd	Concerns with dust, water take effects on aquifer for other users, and rehabilitation	Yes

Some of the adjoining landowners have horticultural activities (grapes, cherries, olives, nut trees, and other fruit trees)

Manukau Fifty Ltd lodged a submission with ORC using the CODC form on 25 May 2021 and a late submission on 22 June 2021. ORC have accepted this submission under s37 of the RMA on 15 October 2021, A1556498.

4. Description of the Environment

4.1 Description of the Site and Surrounding Environment

The environment is adequately described in the application for consent and is not duplicated here. The description is adopted for the purpose of this report. The site is located at 1248 Luggate-Cromwell Road.

The key aspects of the environment are:

- Surrounding land use is a mixture of residential lifestyle properties, vineyards, unirrigated grazing land and a DOC Mahaka Katia Scientific reserve to the north of the expansion area;
- The expansion area of the quarry is currently bare land;
- The quarry and expansion area are located on the upper terrace of Lake Dunstan and is generally flat; and
- Soils mainly comprise of Mataura, Molyneux and Blackman Soils that all have a loam texture.

4.2 Groundwater

The proposed takes are from G41/0127 and G41/0456 in the Pisa Groundwater Management Zone. The bores are approximately 25 to 30 metres deep and are screened within gravel or sandy gravel strata. The location of these bores is identified in Figure 4.

Figure 4: Location of abstraction bores

Source: Otago Maps

Static levels have been recorded at around 13.8 m and 7.1 m below ground level for the two bores, indicating that the piezometric surface lies within the gravel or sandy gravel strata. This information suggests that the aquifer targeted by the applicant's bores is likely to be unconfined.

The applicant has not submitted a recent aquifer pump test for the proposed increased take. This was requested as part of a further information request dated 12 November 2020. As part of the further information submitted by the applicant, they have provided an analysis of a previous pump test undertaken in the previous application RM16.108, along with reviewing aquifer test information of nearby bores. The applicant concludes the transmissivity value of 1,100m^2/day used in the original application is appropriate. E3 Scientific have reviewed the application on behalf of ORC's Resource Science Unit (RSU) and concur with the applicant's assessment but note that the pumping rate does not match what is sought or ORC minimum aquifer test requirements.

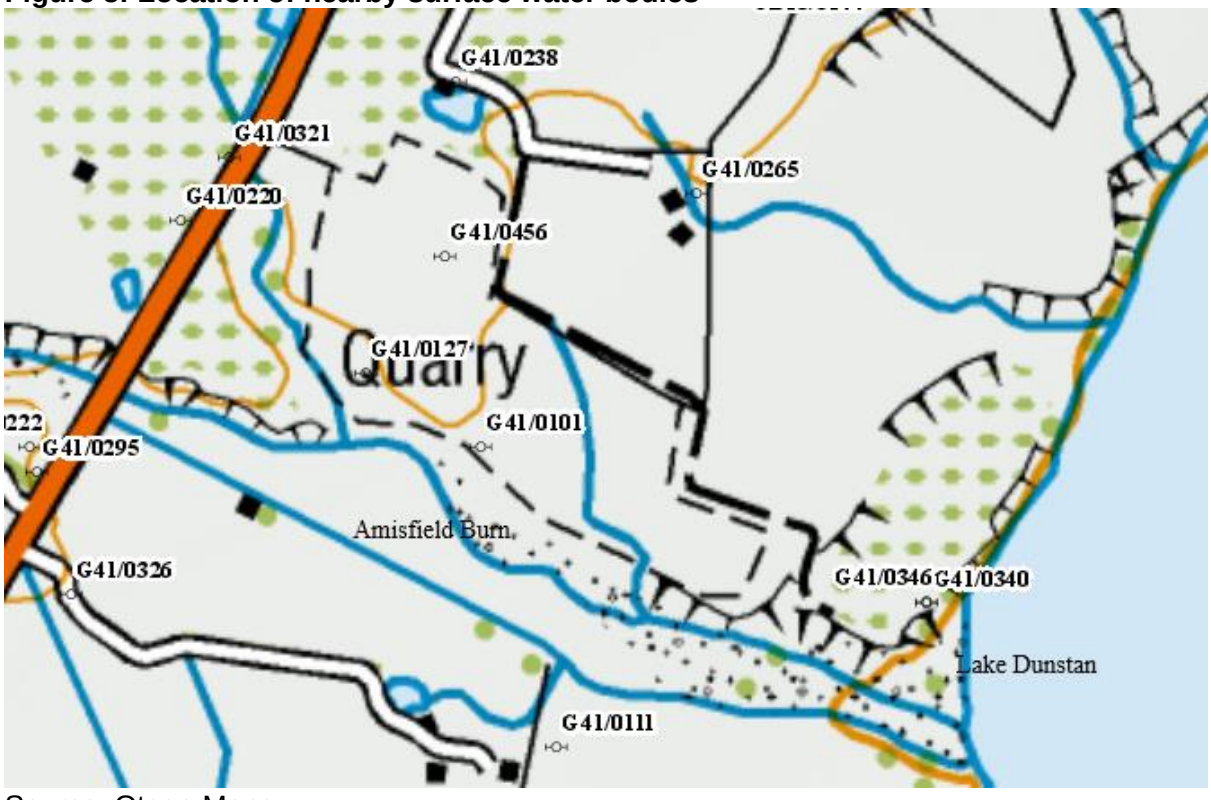
The Pisa Groundwater Management Zone is estimated to have a mean annual recharge of 6,500,000 m^3. The available allocation is estimated to be 2,215,094m^3 according to Otago Maps.

4.3 Description of Surface Water Bodies

Lake Dunstan is located approximately 800 metres from the applicant's groundwater bores and approximately 900 metres from the soakage pond.

The main stem of the Amisfield Burn is located approximately 130 metres south west of G41/0127. This is illustrated in **Figure 5** below.

Figure 5: Location of nearby surface water bodies



Source: Otago Maps

4.4 Schedule 1 of the Regional Plan: Water

The Regional Plan: Water for Otago (RPW) outlines the natural and human use values of various watercourses throughout the Otago Region. Lake Dunstan and Amisfield Burn are identified in this schedule. Lake Dunstan and Amisfield Burn are identified for the following natural and ecosystem values:

- Lake Dunstan
  - Large water body supporting high numbers of particular species, or habitat variety, which can provide for diverse life cycle requirements of a particular species, or a range of species)
  - Gravel/rock bed composition of importance to resident biota.
  - Presence of significant fish spawning areas (trout and salmon)
  - Presence of riparian vegetation of significance to aquatic habitats.
  - Presence of significant areas for development of juvenile trout and salmon.
  - Presence of indigenous fish species threatened with extinction
  - Significant presence of trout, salmon, and eel.
  - Presence of a significant range of indigenous waterfowl.

- Amisfield Burn
  - Absence of aquatic pest plants (eg Lagarosiphon) identified in the Pest Management Strategy for Otago 2009
  - Presence of indigenous fish species threatened with extinction

Schedule 1AA of the RPW identifies Otago resident native freshwater fish and their threat status. Lake Dunstan is known to provide habitat for Clutha flathead galaxias and Amisfield Burn is known to provide habitat for Koaro.

Schedule 1B of the RPW identifies rivers where the water taken is used for public water supply purposes and Schedule 1C identifies registered historic places. There are no Schedule 1B or 1C values in close proximity to the proposed activity.

Schedule 1D of the RPW identifies the spiritual and cultural beliefs, values and uses associated with water bodies of significance to Kai Tahu. Lake Dunstan is identified as having the following values:

- Kaitiakitanga: the exercise of guardianship by Kai Tahu, including the ethic of stewardship.
- Mauri: life force.
- Waahi tapu and/or Waiwhakaheke: sacred places; sites, areas and values of spiritual values of importance to Kai Tahu.
- Waahi taoka: treasured resource; values, sites and resources that are valued.
- Mahika kai: places where food is procured or produced.
- Kohanga: important nursery/spawning areas for native fisheries and/or breeding grounds for birds.
- Trails: sites and water bodies which formed part of traditional routes, including tauraka waka (landing place for canoes); and
- Cultural materials: water bodies that are sources of traditional weaving materials (such as raupo and paru) and rongoa (medicines).

4.5 Schedule 2 of the Regional Plan: Water

Schedule 2 of the RPW identifies specified restrictions on the exercise of permits to take surface water. No surface water take is proposed.

4.6 Regionally Significant Wetlands

Schedule 9 of the RPW identifies Regionally Significant Wetlands and Wetland Management Areas. The Bendigo Wetland is located north-east of the subject site, approximately 700 metres from the quarry area.

4.7 Climate and Soils

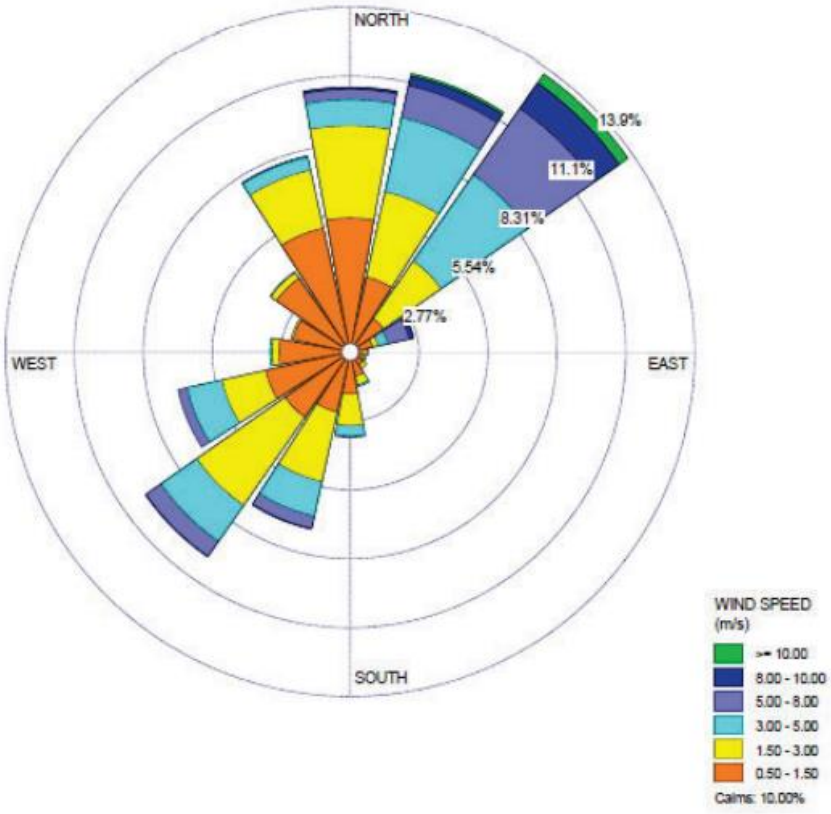
GrowOtago data indicates that the median annual rainfall at the site is between 401-450 mm and that the median potential evapotranspiration in January and February is 211 to 215 mm. S-Map Online indicates that the soils at the site are likely to be a combination of Cromwell moderately deep sandy loams and Molyneux very shallow sandy loams. These soils have moderate to high drought vulnerability and low plant available water. The applicant advises soils mainly comprise of Mataura, Molyneux and Blackman Soils that all have a loam texture.

S-Map online indicates the quarry site comprises of Molyneux and Mataura Soils that are moderately-well drained. The Mataura soils are shown to have a moderate to low (60 to 89mm) profile available water (PAW) value. The Molyneux soils are shown to have a moderate PAW value (90 to 119mm).

The applicant does not measure meteorological variables on site. The applicant has relied on information supplied by Fulton Hogan who have a quarry located approximately 2km south of the applicant's quarry site. Beca have prepared a technical assessment of the potential discharge effects in support of the application and confirms the Fulton Hogan Site is a good representation of the wind conditions experienced on the applicant's site. A windrose prepared for the Fulton Hogan site in 2019 shows wind blows predominantly from the north to northeast and that the strongest winds also come from this direction. Secondary winds blow from the south-westerly quarter and winds from the east and west are rare.

The average wind speed measured during the 2019 monitoring period was 2.1 m/s at the Fulton Hogan quarry. The percentage of winds which exceed 5 m/s from all directions was 10.2% (the critical windspeed for the pickup of dust from unconsolidated surfaces). **Figure 6** below shows the wind rose prepared in support of the application based on data measured at Fulton Hogan Quarry. Further results and data from the Fulton Hogan Quarry have been provided in support of the further information dated 5 March 2021.

Figure 6: Annual windrose of hourly average windspeed and direction measured at Fulton Hogan's Parkburn Quarry



Source: Application

4.8 Air Quality

There is no information available on ambient air quality for the site and surrounding area. The site is located in a rural environment and is expected to have good air quality. Predominant sources of air discharges in the area are quarry activity, traffic generation on unsealed roads, agricultural activities and natural sources such as dry unvegetated paddocks. During periods of low rainfall and strong winds, background dust concentrations may be relatively high due to the natural and agricultural sources in the area.

The quarry is located outside of any gazetted airshed as defined by the National Environmental Standards for Air Quality (NESAQ). The nearest gazetted air shed to the site is the Cromwell Air Zone, which is part of Air Zone 1 as defined in the Air Plan and Airshed 1 as gazetted in the NESAQ. The northern boundary of Airshed 1 is approximately 10.5 km to the south of the quarry.

Further information submitted by the applicant dated 5 March 2021 addresses the potential background dust levels in the area surrounding Amisfield Quarry. The applicant confirms the rural area surrounding the Amisfield Quarry is naturally dry and dusty and other land use activities regularly generate dust. A comparison has been made to a rural area around an open cast goldmine at Earnscleugh in Central Otago. Dustfall data analysed by Beca, between May 2009 and May 2015,

at nine sites in a rural area around an open cast goldmine at Earnscleugh in Central Otago, averaged 1.0 g/m2/30 days but varied from near zero to 15.5 g/m2 /30 days. The land uses on the Earnscleugh Flats are characterised by orchards, vineyards and pastoral farms and mining activities were carried out relatively closely to these activities. The Earnscleugh area has a low rainfall and low average wind speeds which is very similar to the Amisfield Quarry site.

The applicant advises that the Ministry for Environment Good Practice Guide for Assessing and Managing Dust (GPG) reports that background Total Suspended Particulate (TSP) levels in "clean" environments are about 10 to 20 micrograms per cubic metre (µg/m3) but can greatly exceed this in summer in rural areas due to agricultural activities and natural dust erosion. The average background TSP concentration measured at Earnscleugh between May 2009 and May 2011 was 10 µg/m3 but this varied from nearly zero to a maximum 24-hour average value of 96 µg/m3.

5. Status of the Application

5.1 Summary

Resource consent is required under the Regional Plan: Water ("RPW") and the Regional Plan: Air ("RPA") as outline in **Table 9**.

Table 9: Planning Rules

Plan	Rule	Purpose	Activity Status
RPW	12.2.3.2A	Groundwater take	Restricted discretionary
RPW	12.B.1.9	Stormwater discharge	Permitted activity
RPW	12.B.4.1	Discharge contaminants to water or to ground	Discretionary activity
RPW	14.1.1.1	Construct a bore	Controlled activity
PPC7	**-**	-	-
RPA	16.3.14.1	Discharge to air	Discretionary

Excavation is proposed that will intercept groundwater, which is considered a bore under the RPW. The groundwater take is for direct use on the quarry site and is directly related to the stormwater discharge that follows from its use. Use of the water is related to the management of dust on the site associated with the quarrying and in processing activities. The discharge to air follows from the quarrying activities for which the bore construction, groundwater take, and stormwater discharge are required. The use of water to suppress dust is necessary as a mitigation of dust effects. Therefore, all applications are directly linked to each other such that they should be bundled together.

PPC7 was notified by the Council for submissions on 18 March 2020 and the rules have immediate legal effect in accordance with section 86B(3) of the Act, as they relate to water. PPC7 was renotified on 6 July 2020 by the Environmental Protection Authority ("**EPA"**). PPC7 introduces two new rules. As this activity is for a groundwater take that is not considered to be surface water under Policy 6.4.1.A(a), (b) or (c) of the RPW then the rules in PPC7 do not apply. However, PPC7 is relevant in respect of the direction it gives on the consent duration for all water permits to take and use water. This applies in addition to the rules in the operative RPW as the application was lodged with Council after 18 March 2020. A final decision on PC7 was released by the Court on 16 November 2021. No appeals have been received (although the deadline for appeals has not yet passed). As at 23 November the Plan Change has not been through the clause 16 process.

Overall, the application is to be considered as a **discretionary** activity.

All other relevant permitted activity rules are complied with, unless discussed above.

5.2 Operative Regional Plan: Water for Otago

Rule 12.2.3.2A confirms the following:

> "Except as provided for by 12.0.1.3, 12.2.1A.3 and 12.2.3.1A, the taking and use of groundwater is a ***restricted discretionary*** activity, if:
>
> (a) The volume sought is within:
>
> (i) The maximum allocation limit identified in Schedule 4A; or
>
> (ii) 50% of the mean annual recharge calculated under Schedule 4D, for any aquifer not identified in Schedule 4A; or
>
> (iii) That volume specified in an existing resource consent where the assessed maximum annual take of the aquifer exceeds its maximum allocation limit; and
>
> (b) It is subject to any aquifer restriction identified in Schedule 4B; and
>
> (c) Where the rate of surface water depletion is greater than 5 l/s, as calculated using Schedule 5A:
>
> (i) Primary surface water allocation is available; and
>
> (ii) For the Waitaki catchment, allocation to activities set out in Table 12.1.4.2 is available."

The volume sought is within 50% of the mean annual recharge calculated under Schedule 4D and the rate of surface water depletion is less than 5L/s (this is further discussed in the assessment of environmental effects). The groundwater take is therefore considered a restricted discretionary activity under Rule 12.2.3.2A of the RPW.

Excavation is proposed that will intercept groundwater, which is considered a bore under the RPW. The construction of a bore is a controlled activity under Rule 14.1.1.1 of the RPW.

The discharge of water or contaminants from gravel washing operations is not provided for by any permitted activity rules within the RPW. The discharge of water or any contaminant from an industrial premise to water or to land is a discretionary activity under Rule 12.B.4.1.

Stormwater from the site will be discharged to ground and will meet permitted activity Rule 12.B.1.9.

There is a fundamental question to be answered of whether the applicant is seeking a replacement water permit or a new water permit. The rate of take and use is significantly more than the existing water permit so there is an argument to consider it as a new activity, particularly because there is likely to be a change in the nature or character of effects. If this is to be a replacement groundwater it needs to be restricted to the existing rate of take at 46 L/s.

5.3 Notified Plan Change 7 to the Regional Plan Water

On 18 March 2020, Council notified Plan Change 7 to the Water Plan. This plan change is part of the work being undertaken to give effect to the recommendations of the Minister for the Environment[1] in response to a review of Council's planning functions by Professor Skelton[2]. One immediate issue facing ORC was developing a fit for purpose planning framework ahead of the expiry of deemed water permits on 1 October 2021. The purpose of Plan Change 7 is to provide an interim regulatory framework for the assessment of applications to renew[3]:

- Deemed permits expiring in 2021; and
- Any other permit to take and use surface water (including groundwater managed as surface water) expiring prior to 31 December 2025; and
- Provide direction on the consent duration for all water permits to take and use water.

As this activity is for a groundwater take that is not considered to be surface water under Policy 6.4.1.A(a), (b) or (c) of the RPW then the rules and policies in the plan change do not apply.

5.4 Operative Regional Plan: Air for Otago

The discharge of contaminants to air from the sorting, crushing, screening, conveying and storage of powdered or bulk products at a rate greater than 100 tonnes of material an hour is a discretionary activity under Rule 16.3.14.1 of the RPA. The following provisions of Rule 16.3.5.2 cannot be met:

- The crushing and screening of bulk materials is at a rate less than 100 tonnes an hour.

The discharge of contaminants to air from mineral extraction and processing is a discretionary activity under Rule 16.3.14.1 of the RPA. The following provisions of Rule 16.3.5.3 cannot be met:

- The extraction of minerals from the surface or from an open pit at a rate less than 20,000 cubic metres per month and 100,000 cubic metres per year; and
- The crushing and screening of minerals at a rate less than 200 tonnes an hour.

6. Section 104 Evaluation

Section 104 of the Act sets out the matters to be considered when assessing an application for a resource consent. These matters are subject to Part 2, the purpose and principles, which are set out in Sections 5 to 8 of the Act.

The remaining matters of Section 104 to be considered when assessing an application for a resource consent are:

(a) the actual and potential effects on the environment of allowing the activity;

[1] Letter from David Parker (Minister for the Environment) to Otago Regional Council Councillors regarding the Minister's investigation of freshwater management and allocation functions at the Otago Regional Council (18 November 2019).
[2] Peter Skelton "Investigation of freshwater management and allocation functions at the Otago Regional Council (18 November 2019).

[3] Section 32 Evaluation Report – Proposed Plan Change 7, 18 March 2020, p 7.

(ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity;

(b) any relevant provisions of a national environmental standard, other regulations, a national policy statement, the Regional Policy Statement (RPS), the Regional Plan: Water (RPW); and

(c) any other matter the Council considers relevant and reasonably necessary to determine the application.

6.1 S104(1)(a) – Actual and potential effects on the environment of allowing the activity

Section 104(1)(a) of the RMA requires the council to have regard to any actual and potential effects on the environment of allowing the activity. This includes both the positive and the adverse effects.

Permitted baseline

The permitted baseline refers to the effects of permitted activities on the subject site and does not include activities authorised by a resource consent. The permitted baseline may be taken into account and the council has the discretion to disregard those effects where an activity is not fanciful.

There is no permitted baseline for a groundwater take and subsequent use of water at the proposed rate, frequency throughout the year, or at this location. The permitted baseline for the discharge of contaminants to air is permitted for a rate of extraction of up to 100,000 cubic metres of aggregate a year. That is half the rate proposed by the applicant.

Receiving Environment Assessment

When processing a resource consent regard must be had to what constitutes the "environment" to inform the assessment of the effects of a proposal. Section 95A(8) and section 104(1)(a) each require an assessment of the adverse effects or actual and potential effects on the environment respectively in order to make a decision on notification as well as make the substantial decision whether to grant or to refuse a consent.

The receiving environment beyond the subject site includes permitted activities under the relevant plans, lawfully established activities (via existing use rights or resource consent), and any unimplemented resource consents that are likely to be implemented. For resource consents issued by regional councils that are of limited duration, case law has confirmed that for activities that are seeking to be reconsented, the activities subject to those consents should not form part of the receiving environment as it cannot be assumed that existing consents with finite terms will in fact be replaced or replaced on the same conditions. Similarly, the consent term of resource consents for lawfully established activities needs to be considered when considering the effects of the proposed activity on them.

What constitutes the existing/receiving environment for water take and use activities?

The consideration of whether water permits form part of the receiving environment is not influenced by any s124 continuation rights. As such, when assessing the taking of water as part of the replacement process for water permits, the effects on the environment from the take need to be considered as if the take on the subject site does not currently occur. In this case, the existing effects of the water permit that is being replaced are not considered part of the receiving environment. When assessing effects on the environment of the proposal, consideration has been given to the

naturalised flows of the waterbody and the existing values (natural and human use) of the waterbody and how these values will be affected by the proposed take.

There are two existing resource consents, one (RM16.108.01) that allows a groundwater take of up to 46 litres per second from two bores on the site, and the use of water from those bores in processing aggregate and supressing dust, and a further resource consent to discharge contaminants to land and water (RM16.108.02). Both of these permits are due to expire on 21 July 2036. Therefore, the existing environment is modified to that date and that rate of take, use, and discharge until 2036.

Positive effects

The proposal will have the following positive effects:

- Employment of quarry staff and commercial revenue for the operator
- Demand for local products and services
- Provide a source of aggregate important to construction and local infrastructure
- Economic benefits associated with the above for the local and regional economy

Adverse effects

In considering the adverse effects, the Consent Authority:

- may disregard those effects where the plan permits an activity with that effect; and
- must disregard those effects on a person who has provided written approval.

There are no persons who have provided written approvals for these applications.

The assessment of adverse effects undertaken for notification identified and evaluated adverse effects, and these are adopted for the purposes of s104(1)(a).

1. Allocation Status

Maximum allocation limits (and aquifer restrictions, discussed below) are a means of managing the cumulative effects of groundwater takes on long-term storage of an aquifer and on outflows to surface water bodies, while avoiding contamination of groundwater and surface water resources, and permanent aquifer compression.

Policy 6.4.10A2 of the RPW states that 50% of the mean annual recharge calculated under Schedule 4D for any aquifer not listed in Schedule 4A is available for allocation. For the Pisa Groundwater Management Zone this equates to 2,215,094 m^3/year (Mm^3/year). The applicant's assessed maximum annual take does not cause the maximum allocation limit of the aquifer to be exceeded.

2. Aquifer Restriction Levels

No restriction levels have yet been set in Schedule 4B of the RPW for the Pisa Groundwater Management Zone. The Council may review any consent under Section 128(1)(b) of the Act when a regional plan sets rules relating to minimum levels in aquifers. It is recommended that such a review condition is imposed.

3. ***Effects on surrounding groundwater users***

No restriction levels have yet been set in Schedule 4B of the RPW for the Pisa Groundwater Management Zone. The Council may review any consent under Section 128(1)(b) of the Act when a regional plan sets rules relating to minimum levels in aquifers. It is recommended that such a review condition is imposed.

A number of submitters are neighbouring bore owners/users that have raised concerns of impacts on groundwater including depletion of the aquifer at the rate of take.

Abstraction of groundwater creates a cone of depression in groundwater levels (drawdown) that extends laterally from the pumping bore as water is abstracted. This may result in lowering groundwater levels in neighbouring bores. The lowering and/or consequent change in aquifer characteristics may prevent existing users from taking their authorised amount.

The applicant has relied on an aquifer pump test submitted in the previous consent RM16.108. An eight-hour constant rate test was completed in 2015 on G41/0455. Groundwater was pumped at a rate of approximately 2,203 m^3/day (25L/s) and water levels were monitored in the applicant's bore throughout the test. A one-hour recovery test was completed following the constant rate test. Drawdown stabilised at 2.2 m after around 5.5 hours of pumping, and remained at this level throughout the remainder of the test. One minute into the recovery test, drawdown in the pumped bore recovered to within 4 cm of the starting static water level. The rate of pumping that test is not equivalent to the rate of take sought in this application. There are a number of submitters that are concerned that there is a lack of evidence or assessment to allow them to consider the effects of the proposal and they have concerns for the impacts on their neighbouring bores.

The transmissivity values of 1,200 m^2/day and 1,100 m^2/day using the Logan formula and Theis Recovery methods respectively were used in the previous consent. The latter transmissivity value has been utilised by the applicant to assess drawdown effects in this application.

Under the previous consent, it was estimated that 30% of the take abstracted and through consumptive uses is not returned to the aquifer. This equated to an estimated 600m^3/day being returned to the aquifer under the previous consent. The applicant has modelled bore interference based on two scenarios. The first scenario is approximately 30% (precisely 37%) of the daily take is used to estimate drawdown, as applied in the previous consent application. The second scenario is that no water is returned to the aquifer and the water take has a full drawdown effect. The modelled interference drawdown effects are summarised in the table below:

Table 10: Modelled bore interference drawdown effects

Bores	**Current water permit @ 600 m^3/day = 6.9 L/s for 360 days**	**Proposed water permit @ 600 m^3/day = 13 L/s for 280 days**	**Worst possible scenario @ 3,024 m^3/day = 35 L/s for 280 days**
G41/0238 (230m)	0.22m	0.40m	1.1m
G41/0321 (320m) G41/0220 320m)	0.19m	0.34m	0.92m

Source: Application

The previous assessment under RM16.108 indicates the drawdown effect at a rate of 600m^3/day was less than minor due to the drawdown calculations in the closest bores being less than 0.2m for an unconfined aquifer. The increased take will see interference effects greater than 0.2m in the closest bores as identified in the table above. The effects of this bore interference have not been

assessed by the applicant, and the technical audits undertaken by E3 Scientific have only been completed in relation to G41/0005.

Policy 6.4.10B and Schedule 5B of the Regional Plan: Water for Otago state that an acceptable magnitude of drawdown interference is less than 0.2 m for an unconfined aquifer. Interference effects in nearby bores are greater than this. The applicant in their assessment of effects has acknowledged this. The applicant advises the maximum drawdown under a worst-case scenario would be 1.1m or 11% reduction in the available drawdown at G41/0238.

The applicant advises in Canterbury considerable investment has been undertaken in developing guidelines for determining acceptable bore inference and have introduced a concept 'protected available drawdown' under the Canterbury Land and Water Regional Plan. Drawdown is considered significant if it exceeds 20% of the available drawdown. The Canterbury Land and Water Regional Plan is not relevant to this application that is based in Otago and the relevant Policy to consider is 6.4.10B and Schedule 5 of the RPW. The applicant has estimated drawdown to be 4% using the parameters in the previous consent from the pumping test conducted on G41/0455. The applicant considers the 4% drawdown would be an acceptable negligible adverse effect and would not be noticeable by the neighbouring groundwater users in the context of natural groundwater variability.

Alexandra Badenhop from E3 Scientific has undertaken a technical review of the application for ORC to consider the interference effects of the proposed increased take and the available drawdown effects on nearby bores that will likely experience interference effects greater than 0.2m. The bores that are likely to experience drawdown interference effects greater than 0.2m are identified in **Table 11** below. The location of the affected bores are further illustrated in **Figure 7**, that shows the location of the bores in relation to the applicant's bores.

Table 11: Available drawdown of neighbouring bores

Well Number	Owner	Take Consent	Depth	SWL (m.b.g.)	DrillDate	Drawdown	PumpRate	Pump Duration	ScreenFrom	ScreenTo	Available Drawdown (m)	Distance to G41/0127 (m)	Distance to G41/0465 (m)
G41/0101	Cromwell Certified Concrete Limited	2004.294.V1	10	0	1/09/1994		1296					182	257
G41/0111	MCTAINSH D		14.8	8.05	22/08/1995		114.9				3.75	559	669
G41/0127	Cromwell Certified Concrete Limited	RM16.108.01	25.92	13.8	16/09/1995		1296				9.12	0	187
G41/0220	Montero, J	2010.152.V1	36.55	22.22	17/11/2000	6.29	864	360	33.54	36.55	11.32	319	356
G41/0222	Hay R J Hay G J		40	0	12/01/2000		864					458	608
G41/0238	Prophets Rock Vineyard	2001.831	44.87	23.5	30/07/2001	1.75	13	330	41.76	44.76	18.26	404	231
G41/0265	Walnut Ridge Ltd		33.1	18.47	25/05/2002	0.33	112.32				11.63	499	344
G41/0295	Amisfield Farm Ltd	2003.363	30.17	19.83	20/09/2004	1.83	1771				7.34	457	614
G41/0321	Winslow Properties Ltd	RM14.211.02	31.76	20.65	6/03/2007	5.32	1641.6	150			8.11	339	316
G41/0326	Amisfield Road Partnership	RM12.514.01.v	25	0	1/10/2004		121					491	670
G41/0340	Stevinson D		15.2	3.5	15/12/2005	0.28	475				8.7	806	789
G41/0346	Dean Stevenson NZ Ventures LLC	2006.036	15.2	3.5	15/12/2005	0.28	475.2	90			8.7	804	787
G41/0456	Cromwell Certified Concrete Limited	RM16.108.01	28.82	7.1	19/11/2015	16.59	2203.2	4800	27.82	38.82	20.72	187	0

* The available drawdown doesn't include the depth required for a pump above the screen, and simply assumes a 3 m screen where it is not specified i.e . the available drawdown may be 1 – 2 m less.

Source: E3 Scientific Technical Review, Refer Appendix 2

Alexandra Badenhop from E3 Scientific on behalf of Council's Resource Science Unit has confirmed drawdown effects on G41/0111 is 3.75m. As the Pisa Groundwater Management Zone is unconfined, interference is considered significant if the groundwater take induces 0.2 m of drawdown in a neighbouring bore as per Schedule 5B of the Regional Plan: Water for Otago (RPW). G41/0111 is located adjacent to G41/0005 and is on the same site owned by Lindsay Allan Moore and Rosemary Kate Sidey. Due to G41/0005's proximity to G41/0111 it is considered that G41/0005 is likely to experience drawdown effects greater than 0.2m. That further supports a precautionary approach with the rate of take, volume of take, and the duration of the water permit to be granted.

Figure 7: Location of bores that are likely to experience drawdown effects greater than 0.2m

Source: Otago Maps

Section 104(1)(b)(vi) of the Act confirms when considering an application for resource consent, the Consent Authority must have regard to any relevant provisions of a plan or proposed plan. In this case the relevant plan is the Regional Plan: Water for Otago and the following policy applies:

> ***"6.4.10B In managing the taking of groundwater, to have regard to avoiding adverse effects on existing groundwater takes, unless the approval of affected persons has been obtained.***
>
> ***Explanation***
> *This policy recognises that the taking of groundwater from any aquifer can result in bore interference. Bore interference relates to the temporarily reduced ability of users in a localised area to take water due to the taking of water from another bore reducing the pressure or the level of groundwater. When considering the taking of groundwater, regard will be had to avoiding adverse effects on existing takes. Conditions on a resource consent to take groundwater may include limits on the instantaneous take of groundwater from the bore, in order to maintain existing access to water in neighbouring bores. Schedule 5 identifies formulae that will be applied in order to determine the acceptable level of bore interference.*
>
> ***Principal reasons for adopting***
> *This policy is adopted to maintain, as far as possible, the availability of groundwater at existing bores. This will assist to avoid the potential for conflict among those taking groundwater."*

Policy 6.4.10B requires decision makers to have to regard to avoiding adverse effects on existing groundwater takes, unless the approval of affected parties have been obtained. This Policy identifies the appropriate formulae in determining the acceptable level of bore interference under Schedule 5. For an unconfined aquifer this is less than 0.2 metres. As such it is considered the bores identified

in Table 6 are likely to experience interference effects greater than 0.2m and are adversely affected. The Canterbury Land and Water Regional Plan is not relevant to this application that is based in Otago and the relevant Policy to consider is 6.4.10B and Schedule 5 of the RPW.

The applicant advises that the assessment of the level of drawdown almost certainly over-estimates the drawdown effects on neighbouring bores. The worst possible scenario as proposed and assessed by the applicant is unlikely given the proximity of the proposed take to Lake Dunstan, nevertheless it is possible that the worst possible case could occur (no water is returned to the aquifer) and the effects of this must be considered.

When assessing bore interference, Alexandra Badenhop from E3 Scientific note that when an aquifer is unconfined, interference is considered significant if the groundwater take induces 0.2m of drawdown in a neighbouring bore as per Schedule 5B of the RPW. The applicant has not obtained written approval from those parties affected by the bore interference.

In summary the effects on surrounding bores as identified in **Table 11** and that of G41/0005 are minor or more than minor.

4. Effects on surface water bodies

When an aquifer is hydraulically linked to a surface water body, a groundwater take could affect flows, water quality, aquatic ecosystems, amenity values, recreational values, and the spiritual and cultural values of that water body. It is unclear whether there is hydraulic connectivity between the proposed take and Amisfield Burn but the Statement of Evidence by Alexandra Badenop agrees with the applicant that it is unlikely.

The applicant has relied on the previous assessment to assess the potential adverse effects of the proposed take on the Amisfield Burn. The main stem of the Amisfield Burn is located approximately 130 metres from the applicant's bore G41/0127 and 315 metres from G41/0455.

Under RM16.108 stream depletion effects at the Amisfield Burn were calculated using Jenkins equation as stipulated in Schedule 5A of the RPW. At this time with a mean annual abstraction rate of 460 m^3/day, stream depletion after 365 days pumping was approximately 100 % (6.9 L/s). The increased proposed take will likely see a greater stream depletion rate. In accordance with Policy 6.4.1A of the RPW, a depletion effect of over 5L/s is considered potentially more than minor.

The recommending report of RM16.108 acknowledged at the time that the stream is decoupled from the groundwater system. Schedule 5A of the RPW states that stream depletion is unlikely if the stream is separated from the underlying water table by an unsaturated zone that could decouple the interaction between surface water and groundwater. This is a new application with a significantly larger rate of take and volume than was previously assessed, and the conclusions may not be the same.

The applicant advises that the Amisfield Burn is approximately 20 metres above the groundwater table and is disconnected to groundwater. Alexandra Badenhop from E3 Scientific has reviewed the application and confirms it is possible that as the Amisfield Burn flows towards Lake Dunstan, the depth to groundwater may decrease and it may become connected to groundwater. Further information submitted by the applicant dated 1 December 2020 confirms an assessment against stream depletion guidelines developed by Smith M (2009) indicate that the proposed abstraction will unlikely affect a stream so far above groundwater levels. The hydrogeological environment has not altered since the 2016 consent and the applicant considers there is no connection between the

underlying groundwater and the Amisfield Burn. Furthermore, the applicant has highlighted that the abstraction is located at a distance from Lake Dunstan that will not cause adverse stream depletion effects downstream of the Amisfield Burn.

Alexandra Badenhop from E3 Scientific was not initially satisfied that the applicant had shown there will be no connectivity between the proposed groundwater take and the Amsifeld Burn, and has noted the importance of Amisfield Burn providing habitat to koaro.

As part of the further information the applicant has provided a breakdown of water use and the operation of soakage pits that provides evidence of lower percentage of consumptive water use. Alexandra Badenhop from E3 Scientific has reviewed this information and concluded, based on this information, there is a reduced likelihood of stream depletion. In Alexandra Badenhop's Statement of Evidence she notes:

"16. Landpro have asserted that Amisfield Burn is perched above and disconnected from groundwater in the vicinity of the groundwater take. Stream gauging was completed for the Smallburn Limited Partnership water take consent application (PDP, 2020) on 15 January 2019. This confirmed that the stream loses water to ground across the land from SH6 to Lake Dunstan and does not always flow continuously to the lake. This supports the assessment that constant or significant stream depletion from the take is unlikely. If, however, the stream is connected to groundwater closer to the lake where the separation between the water table and streambed decreases, it is possible for the duration and frequency of stream drying to increase when groundwater is pumped. Given the location of Lake Dunstan relative to the Amisfield Burn, the volumes of stream depletion are unlikely to be significant from an ORC Regional Water Plan perspective."

It would seem that the Amisfield Burn is likely to be decoupled from the groundwater system and and the take is not considered to be surface water. There remains some uncertainty and it is possible for the stream to intereact with groundwater where it is closer to Lake Dunstand and this may be relevant to this application, but I have assumed that Policy 6.4.1A does not apply. As noted in Policy 6.4.1 of the RPW, allocation quantities and minimum flows do not apply to water takes from Lake Dunstan.

5. Effects on groundwater quality

The cone of depression created by water abstraction may extend to areas where there could be the potential of groundwater contamination (i.e., from contaminated sites, landfills or effluent discharges), hastening migration or recharge of contamination through the aquifer.

It is noted that the applicant holds Discharge Permit RM16.108.02 and has applied to 'renew' this permit. A discussion on the adverse environmental effects of this discharge is below. In terms of the take, due to the nature of the contaminated sites and the volume of the proposed groundwater take (which will influence the extent of the cone of depression), the risk that the proposed take will cause contamination of the aquifer is no more than minor.

A number of submitters are neighbouring bore owners/users that have raised concerns of impacts on groundwater quality and increasing risks of contamination.

Alexandra Badenhop from E3 Scientific has stated that aquifer contamination due to the groundwater take is unlikely, although the return of water through soakage pits could cause some increases to turbidity. E3 Scientific did not comment on the potential for contamination and water

quality effects as a consequence of exposing groundwater at the site in the technical reviews. However, in Alexandra Badenhop's Statement of Evidence the possibility of increased turbidity in downgradient bores and further notes that the new area of extraction may act as a recharge boundary, and therefore pumping may induce movement of turbid water into the aquifer.

On 10 November 2021 the applicant provided a report on groundwater water quality testing relating to three bores:

- G41/0456 (29 m depth, Amisfield Quarry bore)
- G41/0321 (32m depth, water permit for domestic supply)
- G41/0111 (15 m depth, no current water permit)

All three samples were found to exceed the guideline standards for turbidity and iron, and G41/0456 also exceeded the guideline standard for manganese. None of these guideline standards are of health significance, but relate to aesthetic guidelines. The applicant makes some assumptions about the groundwater gradient based on topography, and has concluded that there it is very unlikely that high turbidity results and iron results found in the neighbouring bores from activities at Amisfield Quarry.

Based on the information presented, my overall conclusion is that the groundwater take will not adversely affect groundwater quality in the aquifer, and that the greatest potential source of contamination is the exposed groundwater within the quarry as a consequence of deeper excavation and those effects have not been quantified by the applicant.

6. Historic water use and efficiency of water use

In the previous application, an assessment was undertaken by Pattle Delamore Partners Ltd that confirmed losses of groundwater during industrial processing meant the take cannot be considered entirely non-consumptive. Losses of groundwater could occur from one or more of the following processes:

- Evaporation from soakage pond;
- Evaporation from washed vehicles, stockpiles, road, or in the processing plant;
- Groundwater held within the washed aggregate when it is exported from the site, or by dust when groundwater is used for dust suppression; and
- Water lost through inefficient application.

Under the previous application approximately 30% of the water abstracted was determined to be lost and not returned to the aquifer.

A significant proportion of water (91.5%) is used for the crushing plant. Water used for crushing operations is received by the soakage ponds. Runoff water is first directed to the smaller pond and then onto the western elongated pond. Sediment collected in the first pond is used for backfill on site or sold on.

Grow Otago estimates the soil moisture deficit to be an annual mean of approximately 420 mm and the total area of the soakage pits is approximately 4,140 m^2. On average the ponds will lose approximately 1,739 m^3/year as evaporation.

In terms of the land application of water, the applicant estimates 11,100m^3 of water is evaporated in the hottest month of the year based on an evaporation rate of 185mm. The applicant has estimated 12% of water applied to land would evaporate in the hottest month of the year and consumptive water use of the take represents less than 20% of the total take. The original 30% consumptive use estimate in the previous application is therefore a conservative estimate and it is considered that the take is an efficient use of water with most water being returned to the aquifer (approximately 88%).

7. Discharge of Contaminants to Land (Water Quality)

The applicant wishes to replace RM16.108.02 due to an increase in the discharge of water. The contaminants in the discharge will be naturally occurring silts and sands from the washing of the gravel, and the majority of the sediment will be removed from the water column by settling in the pond and then by the filtering process as the water moves through the gravels.

The applicant notes there is a risk that the lowering of groundwater levels through increased abstraction will induce land surface contaminants to enter the groundwater resource. The applicant advises the soakage ponds are at or close to the groundwater level and the existing resource consent requires quarterly monitoring of suspended sediment at bores G41/0455 and G41/0101, and one upgradient bore for comparison, either G41/0220 or G41/0321. No limits have been imposed for total suspended solids on the previous consent, however the latest monitoring results dated November 2020 shows the detection limits of less than 3 g/m^3 have not been exceeded. Likewise, previous monitoring results have also not exceeded the detection limit. This indicates that the soakage ponds are performing as expected. The increased discharge is not expected to affect the capacity and performance of the soakage ponds. Contamination of groundwater from the discharge is expected to be no more than minor, provided that the applicant continues to maintain the soakage ponds and prevent overland flow to any surface water body.

8. Discharge of Dust to Air (Air Quality)

A number of submitters have raised concerns with dust effects for health and the environment, including adverse effects on crops and livestock. The AOL and HLFT submissions includes evidence of the submitters' experiences of significant dust generation from the existing quarry on at least4 12 different days. The consequences for additional maintenance costs and equipment failure due to dust discharges is of particular importance for these and other horticultural uses, as well as the potential for dust to adversely affect the crops and livestock on adjoining sites.

Beca prepared a report in support of the application to assess the effects of the discharge of dust to air. The report has been reviewed by NZ Air on behalf of Council's Resource Science Unit. A further information request in relation to air discharge effects was sent to the applicant on 21 January 2021. A response to the further information request was received on 5 March 2021 that provides a comprehensive assessment on the effects of the discharge on surrounding cherry orchards and vineyards. That information was further reviewed by NZ Air.

In the application the applicant assessed the risk of adverse effects associated with dust as less than minor based on the technical assessment provided with the application and taking into account the mitigation measures proposed. Additional comment was provided by Beca and a draft dust management plan that there would be negligible effects for neighbouring receptors.

[4] Attachment 17 is missing attribute data necessary to ascertain the day and time the image was taken. All other attachments have the dates and times they were generated embedded in their attribute data.

Figure 8: Location of affected parties affected by adverse dust effects (red points)

Note: The application site is shown in red.
Source: Otago Maps

The request for further information response acknowledges that particular attention to the mitigation of dust will be required during the higher risk months for horticulture between September and April. Grapes grown for wine productions are expected to be more vulnerable to excessive dust deposition during key periods October to Late April/Early May. Due to the risk of potential dust deposition on crops, the applicant is proposing real-time TSP monitoring and additional mitigation measures as set out in Section 7-3 of the Beca Report whenever there are discharges within 100m of cropping operations.

NZ Air originally considered that the residual risk of adverse effects on crops within 100m of quarrying operations would be low with the mitigation measures proposed, but in the Statement of Evidence recommends a minimum buffer distance of 100 m.

Figure 9: Aerial photograph showing the location of the quarry in relation to neighbouring properties and receptors

Source: Application-Response to Further Information dated 5 March 2021

In terms of the proposed expanded area, the working area is proposed to be setback from the boundary of the site by 25 metres, where the quarry adjoins land used for non-residential purposes and 50 m in the vicinity of the Clark's residence (1308 Luggate-Cromwell Road). Bunds are proposed to be constructed along the boundaries that will be 3 metres high by 6 metres wide. The existing working area of the quarry is located at least 12 metres at its narrowest point from the site boundary and a road is located between the boundary and adjoining properties to the north. The Amisfield Burn is located to the south of the site, acting as a natural barrier between the site boundary and proposed cherry orchards to the south.

The activities of the quarry that generate dust will be:

- Excavation and stripping of overburden;
- Extraction of gravel;
- Overburden stockpiling;
- Raw and finished material stockpiling;
- Loading and unloading of materials;
- Vehicle movements;
- Crushing and screening of gravel; and

- Backfilling of worked areas.

The predominant air discharge contaminant from the quarrying operations will be particulate matter in the form of dust. The products of combustion, such as sulphur dioxide (SO_2), nitrogen oxides (NO_x) and carbon monoxide (CO), will also be discharged in the emissions from the operation of machinery and vehicles. Dust particles will mostly be made up of larger size fractions greater than 10µm.

The Beca report prepared by Prue Harwood in support of the application has highlighted potential health effects may arise from particulate matter generated on site in the form of PM_{10} and $PM_{2.5}$. PM_{10} concentrations downwind of a quarry can be elevated above background concentrations and effective dust control must be carried out to mitigate adverse effects, particularly when the quarry is operating within 100 m of residences located downwind of a quarry.

Table 12: Frequency of winds that could deposit dust on sensitive locations (>5m/s)

Sensitive receiving location	Existing quarry	Expanded quarry
Residence at 1308 Luggate-Cromwell Road	1.7%	0.1 %
Rural land at 1308 Luggate-Cromwell Road	1.8 %	7.9 %
Storage shed at 1308 Luggate-Cromwell Road	1.7 %	7.9 %
Vineyard at the Quarry Entrance	1.7 %	N/A
Workers accommodation at 1286 Luggate-Cromwell Road	0.1 %	0.1 %
Orchard east of existing and expanded quarry (Lot 1 DP 508108)	1.7 %	1.7 %
Orchard south of existing and expanded quarry (Lot 2 DP 508108)	8.3 %	N/A
Residence at 7 Mt Pisa Road	0.1 %	N/A
Vineyards to the west (across Luggate-Cromwell Road)	6.1 %	N/A
Mahaka Katia Scientific Reserve	N/A	1.75 %

Source: Application (Table 8, page 32)

The Clarks, (who submitted on the application) residence and worker accommodation are located within 100 metres of the quarry and are downwind of the quarry for less than 0.1% of the time. Prue Harwood from Beca stated that the risk of PM_{10} discharges from the quarry causing adverse health effects is considered to be negligible based on effects occurring for less than 0.1% of the time. Their land and storage shed would be downwind during these events from the expanded quarry 7.9% of the time. For other residences within the vicinity of the quarry the adverse health effects on these were also considered to be negligible.

Respirable crystalline silica (RCS) can be produced by the crushing and grinding of quartz rich rock. The RFI response notes the existing crushing plant is not proposed to be moved from it's existing position and is a considerable distance away from the nearest sensitive receiver (>250m). Prevailing wind conditions convey any dust discharges away from the nearest sensitive receiver. The applicant considers the separation distance and the mitigation and management measures proposed will minimise the effects of RCS and nuisance dust. Air NZ considers this assessment is accurate and the potential adverse health effects from the discharge of RCS is low to negligible. As such the adverse health effects associated with the discharge is considered to be no more than minor, with implementation of the mitigation and monitoring measures outlined in the Beca Report.

Donovan van Kekem from NZ Air, when reviewing the application for ORC, concludes the greatest risk for adverse off-site effects is from dust emitting activities that are proposed to occur within 100 m of off-site sensitive receptors as intensities of dust deposition will be greatest within close proximity to the sensitive receptors. Mitigation measures have been provided including alarm trigger points which require contributing dust sources within 200 m of sensitive receptors to cease. NZ Air considers the level of mitigation proposed by the applicant is appropriate and residential risk of adverse dust effects at residential and cropping receptors will be low post mitigation.

A building platform for dwellings has been approved by CODC for Lot 1 DP 508108 and Lot 2 DP 508108. I am aware that the land covenant applying to those lot allows for only one dwelling to be erected and that they may not complain about quarry activities on Lot 8 DP 301379. However, they are not constrained in relation to quarrying activities if they were to occur on Lot 3 DP 301379 (quarry expansion area). Therefore, it can be considered that dwellings will likely be established on the approved residential building platforms on Lots 1 and 2 DP 508108 in the future and that this forms part of the existing environment. In light of this, the receiving environment for dust discharges on Lots 1 and 2 DP 508108 are more sensitive. The Beca assessment notes that Lot 1 DP 508108 is downwind of the quarry in winds from the south-west to west. Winds from these directions that exceed 5m/s occur is for approximately 1.7% of the time. The southern area of Lot 2 DP 508108 is downwind from winds approaching from the east north-east through to west north-west. Winds from these directions that exceed 5 m/s are expected to occur for approximately 8.3% of time. There is small frequency of winds exceeding 5m/s at each of these locations, the adverse effects of dust discharges on the platform for Lot 2 DP 508108 is considered to be minor, and less than minor in the case of Lot 1 DP 508108.

Section 104(1)(a) of the Act directs Consent Authorities to have regard to any actual or potential effects on the environment of allowing the activity. The leading Court of Appeal case of what constitutes the environment for the purposes of Section 104 is Queenstown Lakes District Council v Hawthorn Estate Limited (2006, NZRMA 424). In Hawthorn, the Court held that:

> *"[84] … In our view, the word "environment" embraces the future state of the environment as it may be modified by the utilisation of rights to carry out a permitted activity under a District Plan. It also includes the environment as it might be modified by the implementation of resource consents which have been granted at the time a particular application is considered, where it appears likely that those resource consents will be implemented…."*

On 10 November 2021, a review of the original technical assessment and a revised dust management plan was undertaken by WSP Golder on behalf of the applicant that provided a different methodology for managing dust on the site. Those changes included using clean and crush aggregate for haul roads instead of the use of water for dust suppression and that this would also restrict the speed of trucks using the haul roads. Revised trigger values and PM_{10} monitoring are also proposed. The conclusions reached are that it may not be possible to achieve a negligible nuisance or adverse effect on crops for all neighbouring sensitive activities. With regards to potential health effects, this review states that less than minor potential for health effects is likely to be achieved.

When considering the information provided and the various technical reviews relating to this application for a discharge to air from ORC I have also seen additional assessment undertaken on behalf of CODC by Deborah Ryan from PDP for the land use consent to CODC. PDP undertook a review of the original air quality assessment and disagreed with Beca that the potential effect on building platforms to the east of the expansion area on the AOL land would be negligible, finding that this would be a moderate effect. With regards to the Clarks' property PDP found that there

would be a slight to moderate effect. PDP did agree that the dust management plan dated 3 March 2021 was appropriate to the proposal and the sensitivity of the surrounding area. However, this falls short of stating that the effects on these neighbouring sensitive receptors can be satisfactorily mitigated to a minor level of adverse effect.

In the Statement of Evidence prepared by NZAir, a 100 m buffer from sensitive receptors is recommended, and due to the width of Lot 3 that effectively rules out its use for quarrying because it will not be possible to accommodate bunds and a 100 m buffer from all of the sensitive receptors either side of it. In the Statement of Evidence prepared by PDP, there is a high potential for high levels of dust from the quarry and more recent information has not altered their view as to the extent of the potential effects of dust from the proposed quarry expansion.

There is therefore some variation in the views of the technical experts for the applicant and the Councils. I am conscious that there is likely to be caucusing amongst these technical experts, and a further technical expert engaged by a submitter. This report has been prepared prior to that caucusing taking place or for the technical experts (other than from WSP Golder) having visited the site. They may reach some agreement or at least a further refinement of their opinions.

I am inclined to take a cautious view at this time and it is my conclusion that there will be more than minor adverse effects on neighbouring sensitive receptors, particularly the Clark property and the AOL property and Lot 2 DP 508108 that cannot be satisfactorily mitigated to a lower level. In my mind that then brings into question whether the quarry expansion area is suitable for the proposed activities. The separation distance from neighbouring sites and the progressively deeper excavation within the existing quarry site may not have the same scale of effects with ongoing mitigation measures and progressive rehabilitation to reduce the exposed areas at any one time. Continued quarrying in that area would have less than minor effects in my view. I may need to revisit this position once I have had the benefit of considering all of the evidence of technical experts for air quality presented at the hearing.

9. Ecological effects

The activities for which resource consent are sought from ORC relate to the construction of bore, the taking and use of groundwater, and the discharge of contaminants to land. Since the groundwater take will not exceed the available allocation in the Pisa Groundwater Management Zone- and it will not have stream depleting effect, there will be no ecological effects associated with the taking of groundwater. The discharge of wash water to a settlement pond will recharge the aquifer and is unlikely to affect water quality with its separation from the groundwater level. There is some uncertainty about the effects on groundwater quality for the large areas of exposed groundwater where gravel extraction is proposed.

The applicant provided an ecological assessment with the application. That assessment considered the ecological values of the land, and found that the site itself has negligible ecological value. It also found that providing appropriate mitigations are adopted to manage noise and dust, the ecological values associated with the Mahaka Katia Scientific Reserve will be appropriately protected to ensure effects on natural ecosystems and habitats within the reserve are minimal. I agree with the applicant's assessment that the effects of the proposed activities will be less than minor.

10. Natural character and amenity values

Quarrying of the site is progressively extracting material and lowering the ground level within it. Exposure of groundwater within the quarry site will be a permanent change to the natural character

of the site. Through rehabilitation the applicant is seeking to create permanent lake features and batter slopes to provide access from the lakes to the surrounding terraces. The natural character of the site will be altered, but it is an existing quarry where its character has already been altered and it has existing resource consents that provide for that to continue until 2036, unless the gravel resource is extracted prior to that time. Rehabilitation will assist with improving the amenity values of the site and for neighbouring sites.

There is the potential for air discharges of dust to adversely affect amenity values for neighbouring residents. The effects of discharge of dust have been considered above in terms of nuisance and health effects. Those affected sites and the frequency of effects relating to dust emissions can provide a guide to the potential for adverse effects on amenity values too. The Beca report quantified the frequency and duration of those effects and for two properties it is anticipated that wind conditions that may carry dust will affect two neighbouring properties approximately 8% of the time, these being 1308 Luggate-Cromwell Road (Lot 2 DP 301379) and 1286 Luggate-Cromwell Road (Lot 2 DP 508108). That corresponds to a more than minor adverse effect on amenity values for these two properties. In all other instances, there will be less than minor adverse effects on amenity values due to a combination between their separation distance and the infrequency of wind conditions in other directions.

11. Effects on cultural values

The construction of a bore is proposed (quarrying activities that will expose groundwater). While there is no known archaeological significance of the site, the applicant is proposing an accidental discovery protocol in case koiwi or artefacts are uncovered when constructing the bore. For the existing site due to the current depth of excavation, the risk of adverse effects on cultural values is very low. On the quarry expansion area where there has not been excavation previously that risk will be higher, but still a less than minor effect that can be satisfactorily addressed through an accidental discovery protocol.

The potential discharges of contaminants into exposed groundwater may be where the greatest risk to effects on cultural values may lie. If there are significant discharges of sediment from overland flow and the unstabilised surfaces surrounding these exposed areas of groundwater there is potential that will alter the mauri of the awa. With monitoring and progressive stabilisation and rehabilitation this risk could be reduced, but even without additional mitigation measures the scale of these potential effects is likely to be a less than minor effect.

12. Cumulative effects

Cumulative effects beyond the existing quarry operations will follow as a consequence of the proposed expansion with its greater rate of groundwater take, the increased rate of extraction and processing, as well as its expanded footprint. All of those effects have been taken into account in total when assessing the effects separately above.

When considering all of the effects together, the greatest potential adverse effects relate to the increased rate of groundwater take, and the dust effects for two neighbouring properties, but cumulatively these effects will not be greater than the level of effects on a separate basis, because there is little overlap between the areas affected by each.

<u>Ki Uta Ki Tai</u>

With regard to ki uta ki tai, it is considered that the application recognises the interconnectedness of the whole environment, and the interactions between freshwater, land, water bodies, ecosystems, and receiving environments; and that freshwater, and land use and development, in

catchments be managed in an integrated and sustainable way to ensure the health and well-being of water bodies, freshwater ecosystems, and receiving environments. This is because the wash water will be discharged to a settlement pond so that a large proportion of the take is recharged to the aquifer once sediment is removed.

Summary – Actual and Potential Effects

Taking into consideration the positive environmental effects identified above and the assessment of adverse effects done for notification purposes in A1421820, A1477996, and A1491456, actual and potential effects on the environment are considered on balance to be more than minor in relation to the quarry expansion area due to dust effects on residences and sensitive uses, and in the increased rate of groundwater take in bore interference effects (although it would seem that the total take can be accommodated within allocation limits for the aquifer). When considering the adverse effects within the existing quarry footprint (at a corresponding lower demand for water and processing rates) all potential adverse effects would be less than minor in overall terms.

6.2 S104(1)(ab)

The applicant has proposed mitigation measures, but has not proposed or agreed to any additional measures for the purpose of ensuring positive effects on the environment to offset or compensate for any residual adverse effects that will or may result from allowing the activity except perhaps weed and pest management.

6.3 S104(1)(b) Relevant Planning Documents

The relevant planning documents in respect of this application are:

- The National Policy Statement for Freshwater Management 2020
- Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 and Amendment Regulations 2020
- The Operative Regional Policy Statement, Proposed Regional Policy Statement and Partially Operative Regional Policy Statement
- The Regional Plan: Water for Otago
- Proposed Plan Change 7 (Water Permits) (PPC7)

Plan Change 7 (Water Permits) ("PC7") was notified for submissions on 18 March 2020 and has immediate legal effect in accordance with section 86B(3) of the Act. The objective, policies and rules in PC7 establish a consenting regime which provides for a consent duration of no more than six years. A final decision on PC7 was released by the Court on 16 November 2021. No appeals have been received (although the deadline for appeals has not yet passed). As at 23 November the Plan Change has not been through the clause 16 process.L

6.3.1 National Policy Statement Freshwater Management 2020 (NPS-FM)

The National Policy Statement for Fresh Water Management 2020 ("NPS-FM") provides direction to local authorities and resource users regarding activities that affect the health of freshwater and sets out objectives and policies for freshwater management under the RMA.

The NPS-FM came into force on 3 September 2020, replacing the previous 2014 NPS-FM. Although it retains some of the same principles as the NPS-FM 2014, including a strengthened focus on Te Mana o te Wai, the NPS-FM 2020, amongst other things:

- Sets out a framework of objectives and policies to manage activities affecting freshwater in a way that prioritises first, the health and well-being of water bodies and freshwater ecosystems, second, the health needs of people, and third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.
- Requires regional councils to develop long-term visions for freshwater in their region and include those long-term visions as objectives in their regional policy statement.
- Requires every local authority to actively involve tangata whenua in freshwater management.
- Sets out a more expansive National Objectives Framework, and Freshwater Management Unit, environmental flows and levels setting, and take limit setting processes. This includes 13 new attribute states for ecosystem health, including national bottom lines and national targets.
- Specific requirements to protect streams and wetlands and to provide for fish passage – including new policies which must be included in all regional plans.

Part 2 of the NPS-FM sets out the national objective for future freshwater management and 15 separate policies that support this objective.

Relevant policies from the NPS-FM are considered below:

Objective

(1) The objective of this National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises:

(a) first, the health and well-being of water bodies and freshwater ecosystems

(b) second, the health needs of people (such as drinking water)

(c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

As national policy statement this has primacy over all lower order planning instruments. There remains some uncertainty of effects of the proposal on groundwater quality and that is the highest priority in this objective.

Policy 1: Freshwater is managed in a way that gives effect to Te Mana o te Wai.

The NPS-FM defines the concepts of Te Mana o Wai as being:

> *"Te Mana o te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community."*

The NPS-FM directs that every Regional Council must engage with communities and tangata whenua to determine how Te Mana o te Wai applies to water bodies and freshwater ecosystems in the region. It is noted that this has not yet occurred for the Otago Region. In the absence of this, the reduction in take, imposition of the recommended residual flow and consent duration of 15 years may go part way towards giving effect to Te Mana o te Wai. The ORC has identified FMUs in the region. These takes are part of the Clutha River/Mata-Au FMU and the Dunstan Rohe. The Council is in the early stages of identifying the values for this FMU. Council will undertake the remaining steps in the NOF process in upcoming years and plans to notify a new Land and Water Plan in accordance with the NPS-FM 2020 in late 2023. This will set the limits that apply to these catchments. The application of these limits to this activity will be considered when this replacement permit is replaced (should consent be granted) or as part of a review of consent conditions, or both.

Policy 2: Tangata whenua are actively involved in freshwater management (including decision-making processes), and Māori freshwater values are identified and provided for.

Tangata whenua were not identified as an affected party in this consent process through Section 95E. Maori freshwater values are defined in the NPS-FM however these values have not yet been identified in this area as the NPS-FM establishes a prescribed process through which this must be achieved. However, consideration has been given to Māori freshwater values identified by tangata whenua based on direction provided in the RPW and the iwi management plan. Not all of the relief within their submission has been provided for, notably in respect of allocation and term. Allocation limits will likely be established as part of a new Land and Water Plan. The reasons for the consent term sought are discussed later in Section 10 of this report.

Māori freshwater values are defined in the NPS-FM as being: *"the compulsory value of mahinga kai and any other value (whether or not identified in Appendix 1A or 1B) identified for a particular FMU or part of an FMU through collaboration between tangata whenua and the relevant regional council".* The Māori freshwater values are yet to be identified through the prescribed process.

Section 8 requires all persons acting under the Act to take into account the principles of the Treaty of Waitangi. The principles of Te Tiriti o Waitangi, including active protection, equity and participation, have been taken into account in accordance with section 8. Of significance is the Treaty principle of active protection. This needs to be understood as it relates to the mauri of waterbodies. Degradation of mauri can diminish associations and prevent cultural uses, which may occur when an application is taking a significant proportion or all of a waterbody over a long period of time. The proposed conditions and the consent term of 15 years should address this issue. However, it is acknowledged that Aukaha have requested a duration of 6 years in their submission. Active protection is linked to Article Two of the Treaty and partnership responsibilities. When the mauri of waterbodies is degraded, this demonstrates a lack of active protection. Addressing degradation of mauri aligns with national direction around Te Mana o te Wai, which has been assessed in the section of this report on the NPS-FM.

Policy 3: Freshwater is 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.

Policy 11: Freshwater is allocated and used efficiently, all existing over-allocation is phased out, and future over-allocation is avoided.

Policy 15: Communities are enabled to provide for their social, economic, and cultural well-being in a way that is consistent with this National Policy Statement.

The applicant has demonstrated that water would be used efficiently, and the groundwater in this area is not 'over-allocated'. However, this allocation has not been completed with consideration of the National Policy Statement for Freshwater Management 2020. The effects of the rate of take on neighbouring users of groundwater in the catchment will be less likely to be adversely affected if the rate of take is reduced.

6.3.2 Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 and Amendment Regulations 2020

Accurate, complete and current water information is a critical building block in establishing a water management system in which water is effectively allocated and efficiently used.

The regulations apply to holders of water permits (resource consents) which allow fresh water to be taken at a rate of 5 litres/second or more, specifically:

- Regulation 8 - Permit holder must provide records and evidence to regional council

The 2020 amendments introduce additional measuring and reporting requirements in stages starting with takes of more than 20 L/s on 3 September 2022.

Through this consent process, conditions will be placed on any replacement water permit granted, to bring their water use measurement in line with what is required and to require them to provide abstraction data records in accordance with the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 and 2020 Amendments.

6.3.3 Proposed Regional Policy Statement and Partially Operative Regional Policy Statement

The partially operative RPS was made partially operative on the 14th of January 2019 ("PO-RPS") and through various court orders. Since then there have has been number of appeals resolved through the Environment Court. On 15 March 2021, the Council approved and provided notice for these further provisions to be added to the PO-RPS. The provisions that are the subject of court proceedings and are not made operative is now limited to Policy 4.3.7 (significant infrastructure) and specific methods of Chapter 3. None of the remaining proposed provisions are applicable to the application, therefore full weight and consideration can be provided to the PO-RPS.

On 26 June 2021 Council notified the proposed Otago Regional Policy Statement. This RPS gives effect to the NPS-FW 2020 and includes freshwater visions, FMU's and rohe. As this RPS has been notified, it has been included and assessed below.

The relevant provisions of the PORPS include:

- *Provide for the economic wellbeing of Otago's people and communities by enabling the resilient and sustainable use and development of natural and physical resources (Policy 1.1.1)*
- *Provide for social and cultural wellbeing and health and safety by recognising and providing for Kāi Tahu values; taking into account the values of other cultures; taking into account the diverse needs of Otago's people and communities; avoiding significant adverse effects of activities on human health; promoting community resilience and the need to secure resources for the reasonable needs for human wellbeing; promoting good quality and accessible infrastructure and public services (Policy 1.1.2)*
- *Achieve integrated management of Otago's natural and physical resources (Policy 1.2.1)*
- *Taking the principles of Te Tiriti o Waitangi into account including by involving Kāi Tahu in resource management processes implementation, having particular regard to the exercise of kaitiakitaka and taking into account iwi management plans (Policy 2.1.2)*
- *Managing the natural environment to support Kāi Tahu wellbeing (Policy 2.2.1)*
- *Enable Kāi Tahu relationships with wāhi tupuna by recognising that relationships between sites of cultural significance are an important element of wāhi tupuna and recognising and using traditional place names (Policy 2.2.3)*
- *Enable sustainable use of Māori land (Policy 2.2.4)*

- *Safeguard the life-supporting capacity of fresh water and manage fresh water to:*
  - *Maintain good quality water and enhance water quality where it is degraded, including for:*
    - *Important recreation values, including contact recreation; and,*
    - *Existing drinking and stock water supplies;*
  - *Maintain or enhance aquatic:*
    - *Ecosystem health;*
    - *Indigenous habitats; and,*
    - *Indigenous species and their migratory patterns.*
  - *Avoid aquifer compaction and seawater intrusion;*
  - *Maintain or enhance, as far as practicable:*
    - *Natural functioning of rivers, lakes, and wetlands, their riparian margins, and aquifers;*
    - *Coastal values supported by fresh water;*
    - *The habitat of trout and salmon unless detrimental to indigenous biological diversity; and*
    - *Amenity and landscape values of rivers, lakes, and wetlands;*
  - *Control the adverse effects of pest species, prevent their introduction and reduce their spread;*
  - *Avoid, remedy or mitigate the adverse effects of natural hazards, including flooding and erosion; and,*
  - *Avoid, remedy or mitigate adverse effects on existing infrastructure that is reliant on fresh water. (Policy 3.1.1)*
- *Manage the allocation and use of fresh water by undertaking all of the following:*
  - *Recognising and providing for the social and economic benefits of sustainable water use;*
  - *Avoiding over-allocation, and phasing out existing over-allocation, resulting from takes and discharges;*
  - *Ensuring the efficient allocation and use of water by:*
    - *Requiring that the water allocated does not exceed what is necessary for its efficient use;*
    - *Encouraging the development or upgrade of infrastructure that increases efficiency;*
    - *Providing for temporary dewatering activities necessary for construction or maintenance. (Policy 3.1.3)*
- *Manage for water shortage by undertaking all of the following:*
  - *Encouraging land management that improves moisture capture, infiltration, and soil moisture holding capacity.*
  - *Encouraging collective coordination and rationing of the take and use of water when river flows or aquifer levels are lowering, to avoid breaching any minimum flow or aquifer level restriction to optimise use of water available for taking;*
  - *Providing for water harvesting and storage, subject to allocation limits and flow management, to reduce demand on water bodies during periods of low flows. (Policy 3.1.4)*
- *Manage air quality to achieve the following:*
  - *Maintain good ambient air quality that supports human health, or enhance air quality where it has been degraded;*
  - *Maintain or enhance amenity values (Policy 3.1.6)*
- *Safeguard the life-supporting capacity of soil and manage soil (Policy 3.1.7)*

- *Identify and protect outstanding freshwater bodies (Policy 3.2.13 & 3.2.14)*
- *Apply an adaptive management approach, to avoid, remedy or mitigate actual and potential adverse effects that might arise and that can be remedied before they become irreversible (Policy 5.4.2)*
- *Apply a precautionary approach to activities where adverse effects may be uncertain, not able to be determined, or poorly understood but are potentially significant (Policy 5.4.3)*

The proposed activities are not contrary to most of these objectives and policies since no further modification is proposed along the margins of Amisfield Burn, it is possible to address Policy 3.1.7 Soil values by minimising adverse effects, and the groundwater take will not exceed allocation limits at this location. However, where there is some uncertainty to adverse effects the precautionary approach is supported, and the proposal is not consistent with maintaining amenity values or good air quality.

Proposed Otago Regional Policy Statement (P-ORPS 2021)

MW–O1 – Principles of Te Tiriti o Waitangi
The principles of Te Tiriti o Waitangi are given effect in resource management processes and decisions, utilising a partnership approach between councils and Papatipu Rūnaka to ensure that what is valued by *mana whenua* is actively protected in the region.

MW–P2 – Treaty principles
Local authorities exercise their functions and powers in accordance with Treaty principles, by:
(1) recognising the status of Kāi Tahu and facilitating Kāi Tahu involvement in decision-making as a Treaty partner,
(2) including Kāi Tahu in resource management processes and implementation to the extent desired by mana whenua,
(3) recognising and providing for Kāi Tahu values and resource management issues, as identified by *mana whenua*, in resource management decision-making processes and plan implementation,
(4) recognising and providing for the relationship of Kāi Tahu culture and traditions with their ancestral lands, *water*, sites, wāhi tapu, and other taoka by ensuring that Kāi Tahu have the ability to identify these relationships and determine how best to express them,
(5) ensuring that *regional* and *district plans* recognise and provide for Kāi Tahu relationships with Statutory Acknowledgement Areas, tōpuni, *nohoaka* and customary fisheries identified in the NTCSA 1998, including by actively protecting the mauri of these areas,
(6) having particular regard to the ability of Kāi Tahu to exercise kaitiakitaka,
(7) actively pursuing opportunities for:
    (a) delegation or transfer of functions to Kāi Tahu, and
    (b) partnership or joint management arrangements, and
(8) taking into account iwi management plans when making resource management decisions.

MW–P3 – Supporting Kāi Tahu well-being
The natural environment is managed to support Kāi Tahu well-being by:
(1) protecting customary uses, Kāi Tahu values and relationships of Kāi Tahu to resources and areas of significance, and restoring these uses and values where they have been degraded by human activities,
(2) safeguarding the mauri and life-supporting capacity of natural resources, and
(3) working with Kāi Tahu to incorporate mātauraka in resource management.

IM–O2 – Ki uta ki tai
Natural and physical resource management and decision making in Otago embraces ki uta ki tai, recognising that the *environment* is an interconnected system, which depends on its connections to flourish, and must be considered as an interdependent whole.

IM–P2 – Decision priorities
Unless expressly stated otherwise, all decision making under this RPS shall:
(1) first, secure the long-term life-supporting capacity and mauri of the natural environment,
(2) secondly, promote the health needs of people, and
(3) thirdly, safeguard the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

The decision priorities demonstrate where the life-supporting capacity and mauri of the natural environment, then the health needs of people have primacy of the application for quarrying across the full extent of the site.

IM–P4 – Setting a strategic approach to ecosystem health
Healthy ecosystems and ecosystem services are achieved through a planning framework that:
(1) protects their intrinsic values,
(2) takes a long-term strategic approach that recognises changing environments,
(3) recognises and provides for ecosystem complexity and interconnections, and
(4) anticipates, or responds swiftly to, changes in activities, pressures, and trends.

IM–P5 – Managing environmental interconnections
Coordinate the management of interconnected natural and physical resources by recognising and providing for:
(1) situations where the value and function of a natural or physical resource extends beyond the immediate, or directly adjacent, area of interest,
(2) the effects of activities on a natural or physical resource as a whole when that resource is managed as sub-units, and
(3) the impacts of management of one natural or physical resource on the values of another, or on the environment.

IM–P6 – Acting on best available information
Avoid unreasonable delays in decision-making processes by using the best information available at the time, including but not limited to mātauraka Māori, local knowledge, and reliable partial data.

IM–P13 – Managing cumulative effects
Otago's environmental integrity, form, function, and *resilience*, and opportunities for future generations, are protected by recognising and specifically managing the cumulative *effects* of activities on *natural and physical resources* in plans and explicitly accounting for these *effects* in other resource management decisions.

IM–P14 – Human impact
Preserve opportunities for future generations by:
(1) identifying limits to both growth and adverse effects of human activities beyond which the environment will be degraded,
(2) requiring that activities are established in places, and carried out in ways, that are within those limits and are compatible with the natural capabilities and capacities of the resources they rely on, and

(3) regularly assessing and adjusting limits and thresholds for activities over time in light of the actual and potential environmental impacts

IM–P15 – Precautionary approach
Adopt a precautionary approach towards proposed activities whose *effects* are uncertain, unknown or little understood, but could be significantly adverse, particularly where the areas and values within Otago have not been identified in plans as required by this RPS.

This policy supports a precautionary approach as relevant to the dust effects, and effects on groundwater resources for this application.

AIR–O1 – Ambient air quality
Ambient air quality provides for the health and well-being of the people of Otago, amenity and mana whenua values, and the life-supporting capacity of ecosystems.

AIR–O2 – Discharges to air
Human health, amenity and mana whenua values and the life-supporting capacity of ecosystems are protected from the adverse effects of discharges to air.

AIR–P1 – Maintain good ambient air quality
Good ambient air quality is maintained across Otago by:
(1) ensuring discharges to air comply with ambient air quality limits where those limits have been set, and
(2) where limits have not been set, only allowing discharges to air if the adverse effects on ambient air quality are no more than minor.

AIR–P3 – Providing for discharges to air
Allow discharges to air provided they do not adversely affect human health, amenity and mana whenua values and the life supporting capacity of ecosystems.

AIR–P4 – Avoiding certain discharges
Avoid discharges to air that cause offensive, objectionable, noxious or dangerous effects.

AIR–P5 – Managing certain discharges
Manage the effects of discharges to air beyond the boundary of the property of origin from activities that include but are not limited to:
(1) outdoor burning of organic material,
(2) agrichemical and fertiliser spraying,
(3) farming activities,
(4) activities that produce dust, and
(5) industrial and trade activities.

The proposal will produce dust that will have effects beyond the boundaries of the property, and those effects for some adjoining properties will be more than minor with adverse effects for amenity and potentially objectionable effects. The proposal is contrary to these objectives and policies as a result.

LF–WAI–O1 – Te Mana o te Wai
The mauri of Otago's *water bodies* and their health and well-being is protected, and restored where it is *degraded*, and the management of *land* and *water* recognises and reflects that:

(1) water is the foundation and source of all life – na te wai ko te hauora o ngā mea katoa,
(2) there is an integral kinship relationship between water and Kāi Tahu whānui, and this relationship endures through time, connecting past, present and future,
(3) each water body has a unique whakapapa and characteristics,
(4) water and land have a connectedness that supports and perpetuates life, and
(5) Kāi Tahu exercise rakatirataka, manaakitaka and their kaitiakitaka duty of care and attention over wai and all the life it supports.

LF–WAI–P1 – Prioritisation

In all management of fresh water in Otago, prioritise:

(1) first, the health and well-being of water bodies and freshwater ecosystems, te hauora te wai and te hauora o te taiao, and the exercise of mana whenua to uphold these,
(2) second, the health and well-being needs of people, te hauora o te tangata; interacting with water through ingestion (such as drinking water and consuming harvested resources) and immersive activities (such as harvesting resources and bathing), and
(3) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

The application is not inconsistent with this prioritisation if it is considered solely on the allocation limits, but with uncertainty on the scale adverse effects on groundwater quality, there is also uncertainty of whether the application is consistent with this policy.

LF–WAI–P2 – Mana whakahaere

Recognise and give practical effect to Kāi Tahu rakatirataka in respect of fresh water by:

(1) facilitating partnership with, and the active involvement of, mana whenua in freshwater management and decision-making processes,
(2) sustaining the environmental, social, cultural and economic relationships of Kāi Tahu with water bodies,
(3) providing for a range of customary uses, including mahika kai, specific to each water body, and
(4) incorporating mātauraka into decision making, management and monitoring processes.

LF–WAI–P3 – Integrated management/ki uta ki tai Manage the use of *freshwater* and *land* in accordance with tikanga and kawa, using an integrated approach that:

(1) recognises and sustains the connections and interactions between water bodies (large and small, surface and ground, fresh and coastal, permanently flowing, intermittent and ephemeral),
(2) sustains and, wherever possible, restores the connections and interactions between land and water, from the mountains to the sea,
(3) sustains and, wherever possible, restores the habitats of mahika kai and indigenous species, including taoka species associated with the water body,
(4) manages the effects of the use and development of land to maintain or enhance the health and well-being of freshwater and coastal water,
(5) encourages the coordination and sequencing of regional or urban growth to ensure it is sustainable,
(6) has regard to foreseeable climate change risks, and
(7) has regard to cumulative effects and the need to apply a precautionary approach where there is limited available information or uncertainty about potential adverse effects.

LF–WAI–P4 – Giving effect to Te Mana o te Wai

All persons exercising functions and powers under this regional policy statement and all persons who use, develop or protect resources to which this regional policy statement applies must recognise that LF-WAI-O1, LF-WAI-P1, LF-WAI-P2 and LF-WAI-P3 are fundamental to upholding *Te Mana o te Wai*, and must be given effect to when making decisions affecting *freshwater,* including when interpreting and applying the provisions of the LF chapter.

LF–VM–O2 – Clutha Mata-au FMU vision

In the Clutha Mata-au *FMU*:

(1) management of the *FMU* recognises that:
  (a) the Clutha River / Mata-au is a single connected system ki uta ki tai, and
  (b) the source of the wai is pure, coming directly from Tawhirimatea to the top of the mauka and into the awa,
(2) *freshwater* is managed in accordance with the LF–WAI objectives and policies,
(3) the ongoing relationship of Kāi Tahu with *wāhi tūpuna* is sustained,
(4) *water bodies* support thriving mahika kai and Kāi Tahu whānui have access to mahika kai,
(5) indigenous species migrate easily and as naturally as possible along and within the *river* system,
(6) the national significance of the Clutha hydro-electricity generation scheme is recognised,
(7) in addition to (1) to (6) above:
  (a) in the Upper Lakes rohe, the high quality *waters* of the *lakes* and their tributaries are protected, recognising the significance of the purity of these *waters* to Kāi Tahu and to the wider community,
  (b) in the Dunstan, Manuherekia and Roxburgh rohe:
    (i) flows in *water bodies* sustain and, wherever possible, restore the natural form and function of main stems and tributaries to support Kāi Tahu values and practices, and
    (ii) innovative and sustainable *land* and *water* management practices support food production in the area and reduce discharges of nutrients and other *contaminants* to *water bodies* so that they are safe for human contact, and
    (iii) sustainable abstraction occurs from main stems or *groundwater* in preference to tributaries,
  (c) in the Lower Clutha rohe:
    (i) there is no further modification of the shape and behaviour of the *water bodies* and opportunities to restore the natural form and function of *water bodies* are promoted wherever possible,
    (ii) the ecosystem connections between *freshwater*, *wetlands* and the coastal environment are preserved and, wherever possible, restored,
    (iii) *land* management practices reduce discharges of nutrients and other *contaminants* to *water bodies* so that they are safe for human contact, and
    (iv) there are no direct *discharges* of *wastewater* to *water bodies*, and
(8) the outcomes sought in (7) are to be achieved within the following timeframes:
  (a) by 2030 in the Upper Lakes rohe,
  (b) by 2045 in the Dunstan, Roxburgh and Lower Clutha rohe, and
  (c) by 2050 in the Manuherekia rohe.

The Clutha/Mata-au FMU and the Dunstan Rohe are relevant to this application. The application relates to the taking and use of groundwater and will not affected surface water bodies.

LF–VM–P5 – Freshwater Management Units (FMUs) and rohe

Otago's freshwater resources are managed through the following freshwater management units or rohe which are shown on MAP1:

Table 13 – Freshwater Management Units and rohe

Freshwater Management Unit	**Rohe**
Clutha/Mata-au	Upper Lakes Dunstan Manuherekia Roxburgh Lower Clutha
Taieri	n/a
North Otago	n/a
Dunedin & Coast	n/a
Catlins	n/a

The Clutha/Mata-au FMU and the Dunstan Rohe are relevant to this application. No values have been set for these areas.

LF–VM–P6 – Relationship between FMUs and rohe
Where rohe have been defined within FMUs:
(1) environmental outcomes must be developed for the FMU within which the rohe is located,
(2) if additional environmental outcomes are included for rohe, those environmental outcomes:
    (a) set target attribute states that are no less stringent than the parent FMU environmental outcomes if the same attributes are adopted in both the rohe and the FMU, and
    (b) may include additional attributes and target attribute states provided that any additional environmental outcomes give effect to the environmental outcomes for the FMU,
(3) limits and action plans to achieve environmental outcomes may be developed for the FMU or the rohe or a combination of both,
(4) any limit or action plan developed to apply within a rohe:
    (a) prevails over any limit or action plan developed for the FMU for the same attribute, unless explicitly stated to the contrary, and
    (b) must be no less stringent than any limit set for the parent FMU for the same attribute, and
    (c) must not conflict with any limit set for the underlying FMU for attributes that are not the same, and
(5) the term “no less stringent” in this policy applies to attribute states (numeric and narrative) and any other metrics and timeframes (if applicable).

LF–VM–O7 – Integrated management
Land and *water* management apply the ethic of ki uta ki tai and are managed as integrated natural resources, recognising the connections and interactions between *freshwater*, *land* and the coastal environment, and between surface water, *groundwater* and *coastal water*.

The management of discharges and water take/use together and the exposure of groundwater is consistent with an integrated management approach.

LF–FW–O8 – *Freshwater* In Otago’s *water bodies* and their catchments:
(1) the health of the wai supports the health of the people and thriving mahika kai,
(2) *water* flow is continuous throughout the whole system,
(3) the interconnection of *freshwater* (including *groundwater*) and *coastal waters* is recognised,

(4) native fish can migrate easily and as naturally as possible and taoka species and their habitats are protected, and
(5) the significant and outstanding values of Otago's *outstanding water bodies* are identified and protected.

The proposal will create new waterbodies sourced from groundwater, and no changes are proposed that will be contrary to this objective. There is some uncertainty about the interconnection between groundwater and surface water for this application.

LF–FW–O10 – Natural character The natural character of *wetlands, lakes* and *rivers* and their margins is preserved and protected from inappropriate subdivision, use and development.

Historical activity on the site has formed bunds at the margins of a branch of the Amisfield Burn, but not further changes are proposed as a consequence of the current applications.

LF–FW–P7 – *Freshwater* *Environmental outcomes, attribute* states (including target *attribute* states) and *limits* ensure that:

(1) the health and well-being of *water bodies* is maintained or, if *degraded,* improved,
(2) the habitats of indigenous species associated with *water bodies* are protected, including by providing for fish passage,
(3) *specified rivers and lakes* are suitable for primary contact within the following timeframes:
    (a) by 2030, 90% of *rivers* and 98% of *lakes*, and
    (b) by 2040, 95% of *rivers* and 100% of *lakes*, and
(4) mahika kai and *drinking water* are safe for human consumption,
(5) existing *over-allocation* is phased out and future *over-allocation* is avoided, and
(6) *freshwater* is allocated within environmental limits and used efficiently.

LF–FW–P14 – Restoring natural character

Where the natural character of *lakes* and *rivers* and their margins has been reduced or lost, promote actions that:

(1) restore a form and function that reflect the natural behaviours of the *water body*,
(2) improve *water* quality or quantity where it is *degraded*,
(3) increase the presence, *resilience* and abundance of indigenous flora and fauna, including by providing for fish passage within *river* systems,
(4) improve *water body* margins by naturalising bank contours and establishing indigenous vegetation and habitat, and
(5) restore *water* pathways and natural connectivity between *water* systems.

There is potential through rehabilitation to restore natural character at the margins of the Amisfield Burn.

LF–LS–O11 – Land and soil
The life-supporting capacity of Otago's soil resources is safeguarded and the availability and productive capacity of highly productive land for *primary production* is maintained now and for future generations.

LF–LS–O12 – Use of land
The use of *land* in Otago maintains soil quality and contributes to achieving *environmental outcomes* for *freshwater*.

LF–LS–P16 – Integrated management
Recognise that maintaining soil quality requires the integrated management of *land* and *freshwater* resources including the interconnections between soil health, vegetative cover and *water* quality and quantity.

LF–LS–P17 – Soil values
Maintain the mauri, health and productive potential of soils by managing the use and development of *land* in a way that is suited to the natural soil characteristics and that sustains healthy:
(1) soil biological activity and biodiversity,
(2) soil structure, and
(3) soil fertility.

There will not be a need for a water take when quarrying ceases at the site, but there will be a loss of soil resource as a consequence of excavating below groundwater levels and permanently exposing groundwater. This will impact on the future use of the land following the completion of quarrying activity. In this way, the highly productive value of the land will not be maintained that is contrary to these objectives and policies.

6.3.4 Regional Plan: Water for Otago

Objective and Policy Assessment

Relevant policies from the RPW are considered below:

Policy 5.4.2 *In the management of any activity involving surface water, groundwater or the bed or margin of any lake or river, to give priority to avoiding, in preference to remedying or mitigating:*
- *(1) Adverse effects on:*
  - *(a) Natural values identified in Schedule 1A;*
  - *(b) Water supply values identified in Schedule 1B;*
  - *(c) Registered historic places identified in Schedule 1C, or archaeological sites in, on, under or over the bed or margin of a lake or river;*
  - *(d) Spiritual and cultural beliefs, values and uses of significance to Kai Tahu identified in Schedule 1D;*
  - *(e) The natural character of any lake or river, or its margins;*
  - *(f) Amenity values supported by any water body; and*
- *(2) Causing or exacerbating flooding, erosion, land instability, sedimentation or property damage.*

Policy 5.4.3 *In the management of any activity involving surface water, groundwater or the bed or margin of any lake or river, to give priority to avoiding adverse effects on:*
- *(a) Existing lawful uses; and*
- *(b) Existing lawful priorities for the use, of lakes and rivers and their margins.*

Policy 5.4.4 *To recognise Kai Tahu's interests in Otago's lakes and rivers by promoting opportunities for their involvement in resource consent processing.*

Policy 5.4.8 *To have particular regard to the following features of lakes and rivers, and their margins, when considering adverse effects on their natural character:*

(a) The topography, including the setting and bed form of the lake or river;
(b) The natural flow characteristics of the river;
(c) The natural water level of the lake and its fluctuation;
(d) The natural water colour and clarity in the lake or river;
(e) The ecology of the lake or river and its margins; and
(f) The extent of use or development within the catchment, including the extent to which that use and development has influenced matters (a) to (e) above.

Policy 5.4.9 *To have particular regard to the following qualities or characteristics of lakes and rivers, and their margins, when considering adverse effects on amenity values:*

(a) Aesthetic values associated with the lake or river; and
(b) Recreational opportunities provided by the lake or river, or its margins.

The proposed activity will not affect values of the Amisfield Burn or Lake Dunstan as given in Schedules *1A 1AA, 1B, 1C and 1D,* nor will it affect the natural character or amenity values associated with the Amisfield Burn and its tributary more than it has already been altered by activities at its margins or Lake Dunstan. The application relates to an existing quarry activity. Rehabilitation will remove perimeter bunds which is likely to restore natural values. Taking this into account the proposal is not contrary to these policies.

Policy 6.4.0A *To ensure that the quantity of water granted to take is no more than that required for the purpose of use taking into account:*

(a) How local climate, soil, crop or pasture type and water availability affect the quantity of water required; and
(b) The efficiency of the proposed water transport, storage and application system.

The applicant has demonstrated how the water will be used on the site for processing aggregate and dust suppression (and a small amount for potable use) where the quantity of water is related to the level of production on the quarry, and 70% is returned to the aquifer through soakage from the settlement pond. The applicant has demonstrated that reasonableness of the take and that the system for use is an efficient one. If the rate of extraction and processing is reduced than currently sought by the applicant (by virtue of no expanded footprint) the quantity of tf the water take should be reduced to match the need for processing. The application is consistent with this policy in either situation.

6.4.10A4 *Where an application is received to take groundwater by a person who already holds a resource consent to take that water, grant no more water than has been taken under the existing consent, in at least the preceding five years, when:*

(a) The take is from an aquifer where the assessed maximum annual take exceeds its maximum allocation limit; or
(b) The take results in the assessed maximum annual take of an aquifer exceeding its maximum allocation limit,

except in the case of a registered community drinking water supply where an allowance may be made for growth that is reasonably anticipated.

The applicant seeks to take more groundwater than is currently approved. The applicant has previously met metring requirements but no data is available on historical use. The applicant has demonstrated that the water would be used efficiently and that a large proportion (70%) will be discharged to ground with soakage to recharge the aquifer.

If the applications are approved only in relation to Lots 5 and 8 DP 301379 then, it is recommended that consideration be given for granting only the amount able to be accessed, being 46 L/s, 50,220 m^3/month and 453,600 m^3/year are recommended to ensure efficient water volumes for the intended purpose of use, taking into consideration the reduced need for water.

Policy 6.4.12 To promote, establish and support appropriate water allocation committees to assist in the management of water rationing and monitoring during periods of water shortage.

Policy 6.4.12A To promote, approve and support water management groups to assist the Council in the management of water by the exercise of at least one of the following functions:

- *(a) Coordinating the take and use of water authorised by resource consent; or*
- *(b) Rationing the take and use of water to comply with relevant regulatory requirements; or*
- *(c) Recording and reporting information to the Council on the exercise of resource consents as required by consent conditions and other regulatory requirements, including matters requiring enforcement.*

Policy 6.4.12B To manage water rationing amongst water takes, Council may either

- *(a) Support establishment of a water management group; or*
- *(b) Establish a water allocation committee.*

Council may also instigate its own water rationing regime or issue a water shortage direction.

Policy 6.4.12C Where appropriate, to include in water permits to take water a condition that consent holders comply with any Council approved rationing regime.

Policy 6.4.13 To restrict the taking of water in accordance with any Council approved rationing regime.

There are no water allocation committees or water management groups that currently operate within this catchment. A standard condition of consent is recommended that requires the applicant to operate in accordance with any Council approved rationing regime.

Policy 6.4.0C To promote and give preference, as between alternative sources, to the take and use of water from the nearest practicable source.

The applicant has not considered reuse of water from the settlement pond, but that does already allow for the recharge of the aquifer for a large proportion of the water through soakage.

Policy 6.4.1A A groundwater take is allocated as:

- *(a) Surface water, subject to a minimum flow, if the take is from any aquifer in Schedule 2C; or*
- *(b) Surface water, subject to a minimum flow, if the take is within 100 metres of any connected perennial surface water body; or*
- *(c) Groundwater and part surface water if the take is 100 metres or more from any connected perennial surface water body, and depletes that water body most affected by at least 5 litres per second as determined by Schedule 5A; or*
- *(d) Groundwater if (a), (b) and (c) do not apply.*

Policy 6.4.10A1 Enable the taking of water allocated as groundwater by Policy 6.4.1A, by:

- *(a) Determining the volume available for taking as the maximum allocation limit less the assessed maximum annual take for an aquifer calculated using Method 15.8.3.1; and*
- *(b) Applying aquifer restrictions where specified in Schedule 4B.*

Policy 6.4.10A2 Define the maximum allocation limit for an aquifer as:

- *(a) That specified in Schedule 4A; or*
- *(b) For aquifers not in Schedule 4A, 50% of the mean annual recharge calculated under Schedule 4D.*

Policy 6.4.10A3 For any aquifer, avoid allocating beyond the maximum allocation limit, unless the water:

- *(a) Is for a non-consumptive take; or*
- *(b) Has been previously taken under a resource consent; or*
- *(c) Is for a new, consumptive take of a temporary nature that is necessary for construction or repair of a structure; or*
- *(d) Is in a rock formation having an average hydraulic conductivity of less than 1 x 10-5 metres per second, which is not an aquifer mapped in the C-series of this Plan, and is taken in connection with mineral extraction activities.*

Policy 6.4.10A5 In managing the taking of groundwater, avoid in any aquifer:

- *(a) Contamination of groundwater or surface water; and*
- *(b) Permanent aquifer compaction.*

There is sufficient remaining allocation of the aquifer to provide for the proposed take, and some of the take will be returned through soakage. The effects of sedimentation or contamination by exposing a large area of groundwater at this location and extracting aggregate from within it have not been quantified and there is uncertainty about the scale of these effects.

Policy 6.4.11 To provide for the suspension of the taking of water at the minimum flows and aquifer restriction levels set under this Plan.

The Pisa Groundwater Management Zone is estimated to have a mean annual recharge of 6,500,000 m^3. The available allocation is estimated to be 2,215,094m^3 according to Otago Maps

Policy 6.4.10AC To avoid aquifer contamination by:

- *(a) Recognising contaminated sites;*
- *(b) Identifying areas vulnerable to seawater intrusion;*
- *(c) Setting maximum allocation volumes;*
- *(d) Setting aquifer restriction levels;*
- *(e) Restricting takes; and*
- *(f) Requiring monitoring of groundwater quality and levels.*

The site is not a contaminated site or vulnerable to seawater intrusion. The monitoring of groundwater quality and levels should be monitored since a large area of groundwater is to be exposed and extraction undertaken within it.

Policy 6.4.10B In managing the taking of groundwater, to have regard to avoiding adverse effects on existing groundwater takes, unless the approval of affected persons has been obtained.

The written approval of other potentially affected groundwater takers has not been obtained. The potential effects on other groundwater takers has been considered earlier in this report and it was found that the proposed groundwater take is likely to adversely affect other groundwater takers.

Policy 6.4.16 In granting resource consents to take water, or in any review of the conditions of a resource consent to take water, to require the volume and rate of take to be measured in a manner satisfactory to the Council unless it is impractical or unnecessary to do so.

It is a recommended that the taking of water is measured using a water meter, the data recorded electronically using a datalogger and sent to Council via telemetry. This should be secured by a condition of consent.

Policy 6.4.18 Where a resource consent for the taking of water has not been exercised for a continuous period of 2 years or more, disregarding years of seasonal extremes, the Otago Regional Council may cancel the consent.

The recommended water metering condition will allow the Council to monitor the rate and volumes of take, and ensure the water is being used efficiently. Should metering show the consent has been unexercised in accordance with this policy, the consent may be cancelled. A condition to this effect has been recommended.

Policy 9.4.22 In granting resource consents to take water from any aquifer, or in any review of the conditions of a resource consent to take water from any aquifer, where appropriate to require groundwater quality to be monitored.

It is a recommended condition of consent that groundwater quality monitoring is undertaken.

6.3.7.2 Efficiency of Water Take and Use

Commercial Uses

Increasing rates of extraction and production means that the volumes of water take and use are reasonable, and 70% of the water take is to be used for recharge of the aquifer through soakage from the settlement pond. If the rates of extraction and production are not approved as sought, the existing rates of take and use should be adopted since larger volumes will not be required.

6.3.7.3 Efficiency of Water Transport, Storage and Application System

The applicant proposes to use the water on the site in close proximity to the points of take so there will not be transport or storage inefficiencies. Dust suppression will involve an application system suitable for that purpose.

6.3.7.4 Alternative Water Sources

The RPW promotes the management of water in a way that enables continued access to suitable water, ensuring communities can provide for their social, cultural and economic wellbeing, now and for the future. It achieves this by requiring consideration of whether the applied for source of water is the nearest practicable given the proposed location of use including whether the take and use of the water is an efficient use of the water resource, whether there is another practically available and accessible water source, and the wider benefits (economic, social, environmental and cultural) of taking from the water source applied for compared to taking water from other sources (Policy 6.4.0C).

The water will be used locally at the source. There are alternative sources, principally a take from Lake Dunstan given the volume of water available in that large water body, but that is linked to hydro-electrical generation needs. The applicant has not considered reuse of water, but that is largely unnecessary since 70% of the water take will be transferred to the settlement pond for soakage to recharge the aquifer. The proposed source of take from groundwater is the nearest practicable source.

6.3.7.5 Water Take and Use Management

Water Management Groups are voluntary. They provide flexibility for two or more consent holders to cooperate in exercising their consents, but without the added formality associated with a water allocation committee. If a water management group is developed, the applicant should give consideration to joining, as they are a useful means of managing takes in a catchment to ensure the allocation limits are not exceeded.

6.3.5 Proposed Plan Change 7 (Water Permits)

Plan Change 7 (PC7) was notified by the Council on the 18 March 2020 and re-notified by the EPA with the submission period closing on 17 August 2020.

The objective, policies and rules in PC7 establish an interim planning and consenting framework to manage freshwater for the transition from deemed permits to RMA water permits while a long-term sustainable framework is prepared. PC7 has been notified to implement the recommendations of the Minister for the Environment[5] following Professor Skelton's investigation of freshwater management and allocation functions at Otago Regional Council.[6]

Professor Skelton's report and the Minister's recommendations both highlighted inadequacies of the current planning framework in giving effect to the higher order documents, in particular the NPS-FM. While the comprehensive overhaul of the ORC planning framework is underway, the Minister considers that there is an urgent need to ensure that an interim framework is in place between now and 31 December 2025. In his recommendation to ORC the Minister stated:

> *"This is necessary to manage approximately 400-600 future consent applications in over allocated catchments. The possibility of up to 600 consents being granted under the current planning and consenting framework is problematic.I understand that*

[5] Letter from David Parker (Minister for the Environment) to Otago Regional Council Councillors regarding the Minister's investigation of freshwater management and allocation functions at the Otago Regional Council (18 November 2019).
[6] Peter Skelton "Investigation of freshwater management and allocation functions at Otago Regional Council: (report to the Minister for the Environment, November 2019).

around 70 per cent of ORC's currently issued water permits are for durations of 25-35 years, with various expiry dates. This includes over 50 permits that expire in 2050 or later, eight of which are 35 year permits issued this year. I am advised that there is a strong expectation from deemed and RMA water permit holders that their new consents will be for similarly long terms, and that the Council is likely to come under strong pressure to meet these expectations. In my view, long terms for these new consents would be unwise, as they would lock in unsustainable water use, inhibiting the council from effectively implementing the outcomes of its intended new RPS and LWRP."

In response to Professor Skelton highlighting the importance of having robust interim measures in place to provide for short-term consents until the new regional policy statement and land and water regional plan are completed, the Minister formally recommended, under section 24A of the RMA that ORC:

Prepare a plan change by 31 March 2020 that will provide an adequate interim planning and consenting framework to manage freshwater up until the time that new discharge and allocation limits are set, in line with the requirements in the National Policy Statement for Freshwater Management.

The Minister encouraged ORC to consider a narrow plan change that provides for a relatively low cost, and fast issuing of new consents on a short-term basis, as an interim measure until sustainable allocation rules are in place. The Council formally responded to the Minister's recommendations and advised of an agreed work programme which includes PPC7 to provide an adequate interim planning and consenting framework to manage freshwater up until the Council's Land and Water Regional Plan becomes operative.

Weight to be afforded

The objectives and policies of PC7 are relevant to, all new applications that are lodged, in accordance with section 104(1)(b) of the Act.

As PC7 has been notified and a decision released, regard must be had to its provisions as well as the provisions of the operative RPW. While regard must be given to the provisions of PC7, this does not necessarily mean giving full effect to its context. It is up to the decision-maker as to the weight that should be afforded to each of the matters under section 104(1).

In terms of weight applied to proposed provisions, the following has been gathered from case law as relevant for the decision maker to consider the weight to be applied to proposed provisions:

- The extent that it has progressed through the plan-making process[7];
- The extent that the proposed measure has been subject to independent testing or decision making[8];
- Circumstances of injustice[9];

[7] *Queenstown Central Ltd v Queenstown Lakes District Council* [2013] NZHC 815 at [9].
[8] *Hanton v Auckland City Council* [1994] NZMRA 289 (PT).
[9] *Keystone Ridge Ltd v Auckland Bity Council* (HC Auckland, AP24/01, 3 April 2001) at [16] and [37]; *Mapara Valley Preservation Society Incorporated v Taupo District Council* EnvC Auckland A083/07, 1 October 2007, at [51].

- The extent to which a new measure, or the absence of one, might implement a coherent pattern of objectives and policies in a plan[10]; and
- Whether there has been a significant change in Council policy and the new provisions are in accordance with Part 2 of the RMA[11].

The provisions have been through the plan making process and they are directive and are a significant change from the operative provisions of the plan.

PC7 is only an interim step to achieving the purpose of the RMA and giving full effect to the NPS-FM, however, the section 32 report for PPC7, identifies that it is a critical measure in order to achieve this purpose in a timely manner and ensures the current planning framework is more in accordance with Part 2 of the RMA in the interim period.[12] For example, PC7 seeks to manage the abstraction of surface water flows by allocating water to water users on an actual use basis with the consented allocation to be reduced where it currently exceeds actual use. In addition, any residual, minimum flow or take cessation conditions on existing permits are to be carried over to new permits and this will contribute to preventing any further degradation of water quality. Furthermore, it is assessed that PPC7 implements a coherent pattern of objectives and policies as it is designed to be a standalone consenting regime for replacement deemed permits and water permits expiring before 31 December 2025.

When weighting the policies, PC7 represents the most recent approach and thinking particularly when considering the duration of the resource consents.

Objective and Policy Assessment

The relevant PC7 objectives and policies are considered below:

10A.1 Objective

10A.1.1 Facilitate an efficient and effective transition from the operative freshwater planning framework toward a new integrated regional planning framework, by managing:

(a) the take and use of freshwater not previously authorised by a water permit; and

(b) the replacement of Deemed Permits, and

(c) the replacement of water permits for takes and uses of freshwater

where those water permits expire prior to 31 December 2025.

10A.2 Policies

10A.2.1 Irrespective of any other policies in this Plan, avoid granting resource consents that replace deemed permits, or water permits to take and use surface water (including groundwater considered as surface water under policy 6.4.1A (a), (b) and (c) of this Plan) where those water permits expire prior to 31 December 2025, except where:

a. The deemed permit or water permit that is being replaced is a valid permit; and

b. There is no increase in the area under irrigation, except where any additional area to be irrigated is only for orchard or viticulture land uses and all mainline irrigation pipes servicing that additional area where installed before 18 March 2020; and; and

[10] *Keystone Ridge Ltd v Auckland Bity Council* (HC Auckland, AP24/01, 3 April 2001) at [16] and [37]; *Mapara Valley Preservation Society Incorporated v Taupo District Council* EnvC Auckland A083/07, 1 October 2007, at [51].
[11] *Keystone Ridge Ltd v Auckland Bity Council* (HC Auckland, AP24/01, 3 April 2001) at [16].
[12] Section 32 Evaluation Report for PPC7 dated 18 March 2020, p 18.

c. Any existing residual flow, minimum flow or take cessation condition is applied to the new permit; and

d. For takes other than community water supplies there is no increase in:
i. the historical instantaneous rate of abstraction; and
ii. any historical volume of water taken.

Policy 10A.2.1, provides strong direction to 'avoid' granting consent except where the provisions in (a) to (d) are met. As confirmed in the *King Salmon*[13] case, the word 'avoid' takes its ordinary meaning of 'not allow' or 'prevent the occurrence of'. In respect to this policy, it directs that the Council must avoid granting the consent, unless all of the provisions of (a) to (d) are met. In relation to these matters:

10A.2.2 Irrespective of any other policies in this Plan concerning consent duration, only grant resource consents for takes and uses of freshwater, where this activity was not previously authorised by a Deemed Permit or by a water permit expiring prior to 31 December 2025, for a duration of no more than six years.

If the rate of take and use is assessed as a new groundwater take, then the maximum duration to be granted must be six years. If this is a replacement groundwater take at the rate of 46 L/s, then this policy does not apply and a duration of 15 years is possible. Due to the footprint of the quarry being recommended to be restricted to Lot 5 and Lot 8 DP 301379 I have assumed that the rates of extraction and processing will also decrease, and it will no longer be possible to demonstrate the need for an increased volume of water (from 70 L/s) and recommend a duration of 15 years at a maximum rate of take of 46 L/s.

Policy 10A.2.3 applies irrespective of any other policies concerning consent duration. It directs that resource consents only be granted for a duration of no more than 6 years, except where the activity will have no more than minor adverse effects (including no more than minor cumulative effects) on the ecology and the hydrology of the surface water body (and any connected water body) from which the abstraction is to occur. In that case a consent may be granted with an expiry of up to 31 December 2035.

In this instance, if there is no connection between groundwater and surface water bodies, the policy does not constrain the term of the water permit, because it will not have more than minor adverse effects on the ecology or hydrology of a surface water body. However, there remains some uncertainty in relation to the connectivity of the take to Amisfield Burn, so a precautionary approach is recommended and approval should not be granted for an increase in the rate of abstraction or for the volume of water to be taken.

6.3.7 Regional Plan: Air for Otago

Objective and Policy Assessment

Relevant policies from the RPA are considered below:

Objective 6.1.1 To maintain ambient air quality in parts of Otago that have high air quality and enhance ambient air quality in places where it has been degraded.

Objective 6.1.2 To avoid adverse localised effects of contaminant discharges into air on:

[13] *Environmental Defence Society Incorporated v The New Zealand King Salmon Company Limited* [2014] NZSC 38 (King Salmon).

(a) Human health;
(b) Cultural, heritage and amenity values;
(c) Ecosystems and the plants and animals within them; and
(d) The life-supporting capacity of air.

Policy 8.2.3 In the consideration of any application to discharge contaminants into air, Council will have:
(a) Particular regard to avoiding adverse effects including cumulative effects on:
(i) Values of significance to Kai Tahu;
(ii) The health and functioning of ecosystems, plants and animals;
(iii) Cultural, heritage and amenity values;
(iv) Human health; and
(v) Ambient air quality of any airshed; and
(b) Regard to any existing discharge from the site, into air, and its effects.

The proposed discharge of dust is likely to have adverse localised adverse effects on amenity values, plants and animals, and the life supporting capacity of air if the quarry expansion area is approved, but will not have these types of effects if granted solely for the existing quarry footprint.

Policy 8.2.4 The duration of any permit issued to discharge contaminants into air will be determined having regard to:
(a) The mass and nature of the discharge;
(b) The nature and sensitivity of the receiving environment; and
(c) Any existing discharge from the site, into air, and its effects.

Policy 8.2.5 To require, as appropriate, that provision be made for review of the conditions of any resource consent to discharge contaminants into air.

Given the proximity of the site to sensitive uses, it is appropriate that if resource consent is granted that there is provision for a review of conditions to address adverse effects relating to dust and further refine on-site management procedures.

Policy 8.2.8 To avoid discharges to air being noxious, dangerous, offensive or objectionable on the surrounding local environment.

If taking a precautionary view, the quarry expansion area may lead to discharges to air that are at least offensive or objectionable for 8% of the time.

Policy 10.1 Policy for dust from area sources
10.1.1 The Otago Regional Council will encourage:
(a) People undertaking land use activities to adopt management practices to avoid, remedy or mitigate any adverse effects of dust beyond the boundary of the property; and
(b) City and district councils to use land use planning mechanisms and other land management techniques to manage land use activities which have the potential to result in dust beyond the boundary of the property.

Land use consent is also sought from CODC where the effects of dust beyond the boundary of the property are being taken into account.

When considering the continuation and expansion of activities within the existing quarry site, the proposed application is not contrary to these objectives and policies, but is likely to be contrary to these objectives and policies if the quarry expansion area (Lot 3 DP 301379) is approved.

6.4 Section 104(1)(c) - Any other matters

6.4.1 The Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008

The Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008 - The Cry of the People, Te Tangi a Tauira [only applicable to activities south of the Clutha River/Mata Au] is considered to be a relevant other matter for the consideration of this application. This is because the RPW is yet to be amended to take into account this Plan and this Plan expresses the attitudes and values of the four Rūnanga Papatipu o Murihiku – Awarua, Hokonui, Ōraka/Aparima and Waihōpai.

The following objectives and policies are of most relevance to this application:

- Adopt the precautionary principle when making decisions on water abstraction resource consent applications, with respect to the nature and extent of knowledge and understanding of the resource.
- Support and encourage catchment management plans, based on the principle of *ki uta ki tai*, to manage the cumulative impacts of water abstractions in a given area.
- Require that scientifically sound, understandable, and culturally relevant information is provided with resource consent applications for water abstractions, to allow Ngāi Tahu ki Murihiku to fully and effectively assess cultural effects.
- Encourage the installation of appropriate measuring devices (e.g. water meters) on all existing and future water abstractions, to accurately measure, report, and monitor volumes of water being abstracted, and enable better management of water resources.
- Advocate for durations not exceeding 25 years on resource consents related to water abstractions.
- Require that Ngāi Tahu are provided with the opportunity to participate through pre-hearing meetings or other processes in the development of appropriate consent conditions including monitoring conditions to address our concerns.
- Avoid adverse effects on the base flow of any waterway, and thus on the mauri of that waterway and on mahinga kai or taonga species.
- Ngāi Tahu's right to development, as per the Treaty of Waitangi, must be recognised and provided for with respect to water allocation from freshwater resources.
- Encourage water users to be proactive and use water wisely. To encourage best practice and efficient use of water, particularly in terms of:
  - sustainable irrigation design, delivery and management;
  - making best use of available water before water levels get too low;
  - reducing the amount of water lost through evaporation by avoiding irrigating on hot windy days.
- Consideration of consent applications for water abstractions should have particular regard to questions of:
  - how well do we understand the nature and extent of the water resource;
  - how well can we monitor the amount of water abstracted;

- whether land capability (e.g. soil type, vulnerability of underlying groundwater resources) matches the land use enabled by irrigation;
- what might happen in the future (e.g. rainfall and recharge of aquifers, climate change).

- Applications for water abstractions may be required to justify the quantities of water requested. Information may need to be provided to Te Ao Mārama Inc. regarding the proposed water use per hectare, estimated water losses, stocking rates, and the level of efficiency for the scheme. This will enable iwi to put the quantity of water sought in context, and ensure that a test of reasonableness can be applied to consents.
- Require catchment based cumulative effects assessments for activities involving the abstraction of water.
- The establishment of environmental flow regimes must recognise and provide for a diversity of values, including the protection of tangata whenua values.
- Ensure that environmental flow allocation and water management regimes for rivers recognise and provide for the relationship between water quality and quantity.
- Avoid compromising fisheries and biodiversity values associated with spring fed creeks and rivers for the purposes of water abstractions.

The applicant has sought a term of 25 years and has demonstrated an efficient use of the water they are currently taking which is consistent the relevant policies above. While the proposed take is within allocation limits for the groundwater resource, there remains some uncertainty relating to the effect on neighbouring users and whether there is connectivity to the Amisfield Burn so the application at the rates of take sought may not be in accordance with all of the objectives and policies above.

6.4.2 The Kai Tahu ki Otago Natural Resource Management Plan 2005

The Kai Tahu ki Otago Natural Resource Management Plan 2005 (NRMP) is considered to be a relevant other matter for the consideration of this application. This is because the RPW is yet to be amended to take into account this Plan and this Plan expresses the attitudes and values of the four Papatipu Rūnaka: Te Rūnanga o Moeraki, Kāti Huirapa Rūnaka ki Puketeraki, Te Rūnanga o Ōtākou and Hokonui Rūnanga. The following objectives and policies are of most relevance to this application:

- To require that resource consents applications seek only the amount of water actually required for the purpose specified in the application.
- To require that all water takes are metered and reported on, and information be made available upon request to Kai Tahu ki Otago.
- To oppose the granting of water take consents for 35 years.
- To encourage those that extract water for irrigation to use the most efficient method of application.
- To discourage over-watering.

It is noted the policy convention ‘to oppose’ that is used throughout the Kai Tahu ki Otago Natural Resource Management Plan 2005 means ‘an activity or action that must not occur’ in order to achieve the objectives of this Plan and protect Kai Tahu ki Otago values.

The applicant has demonstrated the need for the volume of water required for activities on the site, and how that a large proportion of that water will recharge the aquifer through soakage. I note that if the application is approved in part so that no quarrying is permitted in the expansion area (Lot 3

DP 301379) the demand for water will decrease proportionally. The applicant has also sought a term of 25 years which is in accordance with the maximum term for water takes outlined above.

6.4.3 *Te Rūnanga o Ngāi Tahu Freshwater Policy Statement 1999*

The Ngāi Tahu Freshwater Policy Statement 1999 (NTFP) is considered to be a relevant other matter for the consideration of this application because the RPW is yet to be amended to take into account the NTFP. The NTFP expresses the attitudes and values of Te Rūnanga o Ngāi Tahu.

The following objectives and policies are of most relevance to this application:

6.1 – Wāhi Tapu: To afford total protection to waters that are of particular spiritual significance to Ngai Tahu.

- *Identify sites for immediate protection because of their significance as wāhi tapu.*

The site is not identified as wāhi tapu, but the Clutha/Mata Au is a statutory acknowledgement area. The proposed activities are not contrary to this objective since they are within allocation limits and there will adverse effects on groundwater quality to a less than minor level associated with exposing groundwater.

6.2 – Mauri: To restore, maintain and protect the mauri of freshwater resources.

- *Identify freshwater resources where:*
  - *Mauri is unaffected by modification and human activity so that these waterbodies can be afforded total protection; and*
  - *Mauri is adversely affected, and the activities that cause such affects.*
  - *Accord priority to ensuring the availability of sufficient quantities of water of appropriate water quality to restore, maintain and protect the mauri of a waterbody, in particular priority is to be accorded when developing water allocation regimes.*

The proposed groundwater take will not exceed allocation limits at this location and the modifications proposed will not alter surface water bodies unless there is a connection to Amisfield Burn. It seems likely that the mauri of the freshwater resources will be unaffected by the proposal.

It is considered that, overall, the application is consistent with the objectives and policies of the NTFP.

6.4.5 Report by Professor Skelton and Ministers Recommendation

Professor Peter Skelton was engaged by the Hon David Parker, Minister for the Environment (the Minister) to investigate whether the ORC is adequately carrying out its functions under section 30(1) of the RMA in relation to freshwater management and allocation, particularly the implementation of the NPS-FM.

The October 2019 report concluded that the current planning framework in Otago is not fit for purpose to appropriately consider resource consent applications for new water permits before the expiry of deemed permits in October 2021. It also identified the need for an accelerated full review

of the Water Plan (to notify a new Land and Water Plan by December 2023) and a full review of the Regional Policy Statement (to notify by November 2020).

To bridge the gap between the expiry of deemed permits in Otago in 202 and other water permits expiring prior to a full plan review, and when a new Regional Policy Statement and Land and Water Plan for Otago will be operative, the Minister has recommended an interim change to the Water Plan. This has recently been notified as Proposed Plan Change 7 (Water Permits) (PPC7).

The application is for the replacement of existing water permits rather than deemed permits.

7. Section 104(2A) Value of Investment

When considering an application affected by Section 124 of the Act, the Council must have regard to the value of the investment of the existing consent holder. The applicant has not provided the evidence of the value of investment other than making general comments of the impacts of prior investments on future operating efficiency in the Economic Assessment. Information was provided on the 2020 Operational and Maintenance spending of the Quarry ($606,800) and direct spending on wages/salaries of $720,000 per year.

8. Section 124B Applications by Existing Holders of Resource Consents

The following criteria must be considered when a person who holds an existing resource consent makes an application to use a natural resource and that is affected by Section 124, and the consent authority receives one or more other applications to use some or all of the natural resource to which the existing consent relates, and that could not be exercised until the expiry of the existing consent.

The application affected by s124 is entitled to priority over any other application and the consent authority must determine that application before any other applications.

In order to make the determination of the application affected by s124, the consent authority must apply all the relevant provisions of this Act and the following criteria:

(a) the efficiency of the person's use of the resource; and
(b) the use of industry good practice by the person; and
(c) if the person has been served with an enforcement order not later cancelled under section 321, or has been convicted of an offence under section 338,
    (i) how many enforcement orders were served or convictions entered; and
    (ii) how serious the enforcement orders or convictions were; and
    (iii) how recently the enforcement orders were served or the convictions entered.

As there is currently such an application before Council, the above matters have been considered and there has been no enforcement orders or convictions served in relation to past use of the water at the site. The applicant has demonstrated that a large proportion of the water taken will continue to be discharged to land and recharge the aquifer through soakage.

10. Sections 105 and 107

Since the application includes applications for discharge permits, s105 and s107 of the RMA are relevant to this assessment.

105 Matters relevant to certain applications

(1) If an application is for a discharge permit or coastal permit to do something that would contravene section 15 or section 15B, the consent authority must, in addition to the matters in section 104(1), have regard to—

(a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and

(b) the applicant's reasons for the proposed choice; and

(c) any possible alternative methods of discharge, including discharge into any other receiving environment.

(2) If an application is for a resource consent for a reclamation, the consent authority must, in addition to the matters in section 104(1), consider whether an esplanade reserve or esplanade strip is appropriate and, if so, impose a condition under section 108(2)(g) on the resource consent.

The sensitivity of the receiving environment has been considered in the assessment of effects above and I accept that the discharge of wash water into a settlement pond is an appropriate mechanism for filtering sediment as a contaminant prior to recharging the aquifer through soakage to satisfy the requirements of s105. With regard to the sensitivity of the environment for the discharge of dust to air, there are likely to be adverse effects on some sensitive receptors near to the proposed quarry expansion area to more than a minor level. I have taken this into account in this assessment.

107 Restriction on grant of certain discharge permits

(1) Except as provided in subsection (2), a consent authority shall not grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A allowing—

(a) the discharge of a contaminant or water into water; or

(b) a discharge of a contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; or

(ba) the dumping in the coastal marine area from any ship, aircraft, or offshore installation of any waste or other matter that is a contaminant,—

if, after reasonable mixing, the contaminant or water discharged (either by itself or in combination with the same, similar, or other contaminants or water), is likely to give rise to all or any of the following effects in the receiving waters:

(c) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials:

(d) any conspicuous change in the colour or visual clarity:

(e) any emission of objectionable odour:

(f) the rendering of fresh water unsuitable for consumption by farm animals:

(g) any significant adverse effects on aquatic life.

(2) A consent authority may grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A that may allow any of the effects described in subsection (1) if it is satisfied—

(a) that exceptional circumstances justify the granting of the permit; or

(b) that the discharge is of a temporary nature; or

(c) that the discharge is associated with necessary maintenance work— and that it is consistent with the purpose of this Act to do so.

(3) In addition to any other conditions imposed under this Act, a discharge permit or coastal permit may include conditions requiring the holder of the permit to undertake such works in such stages throughout the term of the permit as will ensure that upon the expiry of the permit the holder can meet the requirements of subsection (1) and of any relevant regional rules.

The proposed discharge of wash water into a settlement pond is an appropriate mechanism for filtering sediment as a contaminant prior to recharging the aquifer through soakage such that it will not give rise to the effects described in restrictions on discharge permits in s107. The proposed discharge of dust to air will not affect water or lead to the effects described in s107(1).

11. Part 2 of the Act

Under Section 104(1) of the RMA, a consent authority must consider resource consent applications "subject to Part 2" of the RMA, specifically, sections 5, 6, 7 and 8.

Section 5 identifies the purpose of the RMA as the sustainable management of natural and physical resources. This means managing the use of natural and physical resources in a way that enables people and communities to provide for their social, cultural and economic well-being while sustaining those resources for future generations, protecting the life supporting capacity of ecosystems, and avoiding, remedying or mitigating adverse effects on the environment.

Section s6, 7 and 8 outline the principles of the Act. Section 6 sets out a number of matters of national importance which need to be recognised and provided for, section 7 identifies a number of “other matters” to be given particular regard by the council, and section 8 requires the council to take into account the principles of the Treaty of Waitangi.

The Court of Appeal has clarified how to approach the assessment of “subject to Part 2” in section 104(1). In *R J Davidson* the Court of Appeal found that decision makers must consider Part 2 when making decisions on resource consent applications, where it is appropriate to do so. The extent to which Part 2 of the RMA should be referred to depends on the nature and content of the planning documents being considered.

Where the relevant planning documents have been prepared having regard to Part 2 of the RMA, and with a coherent set of policies designed to achieve clear environmental outcomes, consideration of Part 2 is not ultimately required. In this situation, the policies of these planning documents should be implemented by the consent authority. The consideration of Part 2 "would not add anything to the evaluative exercise" as "genuine consideration and application of relevant plan considerations may leave little room for Part 2 to influence the outcome". However, the consideration of Part 2 is not prevented, but Part 2 cannot be used to subvert a clearly relevant restriction or directive policy in a planning document.

Where it is unclear from the planning documents whether consent should be granted or refused, and the consent authority has to exercise a judgment, Part 2 should be considered.

In the context of this activity applications for land use (bore), water permits, and discharge permits, where the objectives and policies of the relevant statutory documents were prepared having regard to Part 2 of the RMA, they capture all relevant planning considerations and contain a coherent set of policies designed to achieve clear environmental outcomes. They also provide a clear framework for assessing all relevant potential effects, and I find that there is no need to go beyond these

provisions and look to Part 2 in making this decision as an assessment against Part 2 would not add anything to the evaluative exercise.

12. Overall Recommendation

Under section 104B it is recommended that this consent application is approved in part subject to conditions for the following reasons for the more than minor effects of the increased rate of take on neighbouring bore users and owners, and the dust effects on neighbouring activities and residents that would follow from the expansion of the quarry to Lot 3 DP 301379. The same level of adverse effects would not result from deeper excavations within Lots 5 and 8 DP 301379 and would be less than minor and therefore acceptable.

- In accordance with an assessment under ss104(1)(a) and (ab) of the RMA, the actual and potential effects from the proposal are found to be not acceptable, because the dust effects are likely to be significant for three neighbouring sites, there is insufficient information to determine that exposing groundwater and extraction activities within it will not adversely affect groundwater quality, and the proposed rate of groundwater take will have significant bore interference effects for neighbouring users. It is not possible to mitigate the scale of those effects to an acceptable level The application does not provide for any offsetting of residual adverse effects at issue. There will be positive economic effects associated with the proposal but they do not outweigh the adverse effects of the proposal. Providing a 100 m buffer of activities from the quarry expansion area renders that site unusable for that purpose. However, when considering the adverse effects within the existing quarry footprint (at a corresponding lower demand for water and processing rates) all potential adverse effects would be less than minor in overall terms.
- In accordance with an assessment under s104(1)(b) of the RMA, the proposal is found to be contrary to some provisions of the relevant statutory documents:
  - National Policy Statement for Freshwater for Freshwater Management 2020 (broadly in accordance if approved for no more than 15 years);
  - Partially Operative Regional Policy Statement (contrary to maintaining amenity values, good air quality);
  - Proposed Otago Regional Policy Statement (sufficient allocation, but uncertainty of groundwater quality effects (bore) and bore interference effects);
  - Regional Plan: Water for Otago (efficiency and need for use demonstrated, take within allocation limits, but uncertainty of groundwater quality effects (bore));
  - PPC7 (relevant to duration of water permits, consistent if there is no connection to Amisfield Burn); and
  - Regional Plan: Air for Otago (contrary to air quality outcomes if including activities on Lot 3 DP 301379).

- In accordance with an assessment under s104(1)(c) of the RMA the following other matters have been considered:

  - Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008
  - The Kai Tahu ki Otago Natural Resource Management Plan 2005
  - Report by Professor Skelton and Ministers Recommendation

  The term of 25 years for a replacement water permit is possible with reference to these documents and the application is more assuredly consistent with them if it is for a reduced volume of water take that would be needed if no quarrying is undertaken on Lot 3 DP 301379. It may be that a discharge permit to air is no longer required if the rate of extraction and processing is less than sought in the application as a consequence.

- No matters have arisen in the assessment of the application that would indicate the application should have been publicly notified.

- When assessing s105 and s107 of the RMA, the application can avoid adverse effects on sensitive receptors that are more than minor if the expansion area of Lot 3 DP 301379 is not granted approval. The discharges are otherwise able to meet the requirements of s107(1).

- There is no need to look to Part 2 of the RMA in making this decision, as the objectives and policies of the relevant statutory documents were prepared having regard to Part 2 of the RMA and they have captured all relevant planning considerations. They also contain a coherent set of policies designed to achieve clear environmental outcomes and provide a clear framework for assessing all relevant actual and potential effects. An assessment against Part 2 would not add anything to the evaluative exercise.

Overall, the proposal is acceptable in my opinion if it does not include quarrying activity on Lot 3 DP 301379 because progressive excavation to lower depths and the rate of water use required would not have the same level of adverse effects than if it were included. The extent and orientation of the expanded quarry and the additional demand for groundwater will have adverse effects to more than a minor level for neighbouring sites and bore users.

13 Section 108 and 108AA of the Act

Should the decision maker wish to grant the applications, the attached conditions on RM20.360.01 to RM20.360.04 are recommended in accordance with Sections 108 and 108AA of the Act.

Conditions have been recommended in order to avoid dust effects that are more than minor on adjoining properties, mitigate potential adverse effects of bore interference effects, and minimise the potential for groundwater contamination as a consequence of exposing large areas of groundwater.
The conditions are directly connected to adverse effects of the activity and/or regional rules as is required by s108AA of the RMA.

Draft conditions were offered by the applicant and these have been included, and these have been supplemented with additional conditions to address specific policies of the relevant plans.

The recommended condition in relation to the duration of consent, lapse date for consent, and for a s128 review condition for RM20.360.01 to RM20.360.04 are discussed below.

The full set of recommended conditions is appended to this s42A recommendation (**Appendix 1**).

13.1 Term of Consent (Section 123)

I note that the applicant holds existing resource consents that allow for a groundwater take to use water, and discharge contaminants in a settlement pond for a period of 14.5 years (21 July 2036 expiry). The current application seeks new resource consents at a higher rate of take and discharge, and an additional resource consent (discharge to air) for a term of 25 years. The application for a bore is sought for an unlimited term since the bore would remain once constructed (this being a large area of exposed groundwater rather than a narrow diameter hole).

It is considered that a duration of 15 years is more appropriate for all resource consents as a consequence of the policy context and the uncertainty relating to the proposed groundwater take on a neighbouring bore. An unlimited term for the bore is appropriate. In reaching this recommendation the following relevant factors as distilled from case law have been considered:

- The duration of a resource consent should be decided in a manner which meets the RMA's purpose of sustainable management;
- Whether adverse effects would be likely to increase or vary during the term of the consent;
- Whether there is an expectation that new information regarding mitigation would become available during the term of the consent;
- Whether the impact of the duration could hinder implementation of an integrated management plan (including a new plan);
- That conditions may be imposed requiring adoption of the best practicable option, requiring supply of information relating to the exercise of the consent, and requiring observance of minimum standards of quality in the receiving environment;
- Whether review conditions are able to control adverse effects;
- Whether the relevant plan addresses the question of the duration of a consent;
- The life expectancy of the asset for which consents are sought;
- Whether there was significant capital investment in the activity/asset; and
- Whether a particular period of duration would better achieve administrative efficiency.

Policy 6.4.19 of the RPW states that when considering the duration of a resource consent to take and use water the following are considered:

- The duration of the purpose of use;
- The presence of a catchment minimum flow or aquifer restriction level;
- Climatic variability and consequent changes in local demand for water;
- The extent to which the risk of potentially significant adverse effects arising from the activity may be adequately managed through review conditions;
- Conditions that allow for the adaptive management of the take and use of water;
- The value of the investment in infrastructure; and
- Use of industry best practice.

The explanation to the policy states the following:

> *The duration of each resource consent to take and use water should have regard to the particular circumstances of the activity and its likely environmental effects, but there needs to be good reason for Council to reduce the duration of consents from that required for the purpose of use. There can be tension between granting sufficiently long consent durations to enable continued business viability and managing the greater environmental risk associated with long duration consents.*
>
> *Where more is known about a water resource, such as when a catchment minimum flow has been specified in Schedule 2B, or an aquifer restriction level has been specified in Schedule 4B, and a council approved rationing regime will be adhered to, the risk of adverse effects being unforeseen is reduced and longer duration consents may be appropriate.*
>
> *Consent review provisions provide an opportunity to allow longer consent durations while ensuring the requirements of this Plan are met over time. Where there is a higher degree of risk of adverse effects, uncertainty of longer term availability of the water resource, or the applicant is unwilling to volunteer adaptive management conditions (it may be too difficult to set suitable review conditions), a shorter duration consent may be appropriate.*
>
> *Adaptive management provisions may be volunteered in situations where there is uncertainty about the response required to meet future change, including rapidly changing technology or a rapidly changing environment. Such provisions enable a proposal to proceed with sufficient, but not exhaustive, assessments of all risks and contingencies. Environmental standards initially set may be varied to be more or less restrictive over the life of the consent, in light of changing circumstances and community expectations.*
>
> *Short duration consents should not be used as an alternative to declining consent, or as a response to poor assessments of environmental effects prepared by consent applicants.*

The principal reasons for adopting the policy are:

> *This policy provides greater certainty on the assessment criteria used when deciding on the duration of the consent to take and use water.*

Policy 6.4.19 of the RPW addresses consent duration for consents to take and use water. It does not recommend actual durations but instead contains seven criteria for to consider. In this case:

- Criteria (a) – While there are quarrying operations there will be a consistent need for water for dust suppression and aggregate processing, so the duration is matched to this demand scenario.

- Criteria (b) – There is a substantial allocation remaining in this catchment that makes a term of 15 years appropriate.

- Criteria (d) – A review condition can safeguard against the risks of granting approval for the 15 years sought so as to address adverse effects that have not been anticipated through this application.

- Criteria (f) – There is likely to be a significant value of the investment in infrastructure at the quarry that support a term of 25 years.

The Kai Tahu ki Otago Natural Resource Management Plan 2005 oppose consents granted for up to 35 years and the Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008 advocate for terms of consent not greater than 25 years. Therefore, the recommended term of 25 years is consistent with the relevant iwi management plans.

The objective and policies of PC7 are relevant to consent applications that have been lodged but not determined (i.e. all resource consent applications currently being processed), and all new applications that are lodged in accordance with section 104(1)(b) of the RMA. The objective and policies of PPC7 are directive and provide that:

As noted above, Policy 10A.2.3 of PC7 relates to the duration of new resource consents that replace deemed permits:

Policy 10A.2.3 Irrespective of any other policies in this Plan concerning consent duration, avoid granting resource consents that replace deemed permits, or resource consents that replace water permits to take and use surface water (including groundwater considered as surface water under policy 6.4.1A (a), (b) and (c) of this Plan) where those water permits expire prior to 31 December 2025, for a duration of no more than six years, except:

(a) Where the take and use of water replaces a Deemed Permit associated with hydro-electricity generation infrastructure listed in Schedule 10A.5.1 and the applicant takes practicable steps to remedy or mitigate any adverse effects arising from the activity.

Policy 10A.2.3 of PC7 directs that new consents to replace deemed permits only be granted for no more than 6 years except in the restricted circumstances above. This is irrespective of any other policies in the Plan concerning consent duration, i.e. Policy 6.4.19.

The water permits (take and use) to be replaced are valid at a lower rate of take and use until 2036. As discussed above, a replacement water permit must be at the same rate of take, otherwise it is a new water permit. While there is some uncertainty about the potential adverse effects of the rate of take, an increased rate of take and a longer period than 2036 would not be acceptable, and if granted the duration must be six years.

A 15-year term of consent for the water permits and discharge permits is recommended for the following reasons:

a. Policy context and requirements for water permits.
b. Uncertainties for impacts related to groundwater quality, and bore interference effects.
c. Consistent terms for all aspects of the activity.
d. Half of the allocation sought is already permitted under the existing water permit until 2036 and a replacement water permit should have the same rate of take.
e. Review conditions can provide a reasonable safeguard against unanticipated effects or changes in the environment.

An unlimited term of consent for the bore is recommended for the following reasons:

a. The large extent of exposed groundwater does not make it practicable to require reinstatement to effectively remove the bore at the completion of quarrying activities.

13.2 Lapse Period (Section 125)

Under s125, if a resource consent is not given effect to within five years of the date of the commencement (or any other time as specified) it lapses automatically, unless the council has granted an extension.

The application seeks a lapse period of 5 years. In this case, 5 years is considered an appropriate period for the consent holder to implement the consent due to the nature and scale of the proposal.

In particular, the 5 years lapse period is recommended for the following reasons:

a. This is a modification of an existing activity with reduced uncertainty about establishment; and
b. The applicant has not sought a longer lapse period.

13.3. Cancellation of Consent (Section 126)

Pursuant to section 126(1) of the RMA, the Consent Authority may cancel this consent by written notice served on the Consent Holder if the consent has been exercised in the past but has not been exercised during the preceding five years, unless expressly provided otherwise by the resource consent.

Policy 6.4.18 in the RPW provides for the council to cancel a resource consent if not exercised in the preceding 2 years. In this case, I consider that a condition is required to expressly provide for Council, as provided by s126((2)(a), to cancel this consent if not exercised in the preceding 2 years to align with Policy 6.4.18.

An advice note is recommended to inform the applicant of the provisions under s126(2)(2)(b), including their appeal rights.

13.4 Review Condition (Section 128)

The RMA provides for the council to review conditions at any time or times specified for that purpose in the consent where there are any adverse effects that may arise from the exercise of the consent, or in relation to a coastal, water or discharge permit where a regional plan or NES has changed. In addition, the council can review other conditions (such as those outlined in the advice note above) without having to set out in a condition the timeframes within which it will review them.

A review condition has been recommended on the following consents:

- RM20.360.01 Water permit (groundwater)
- RM20.360.02 Discharge permit (ground)
- RM20.360.03 Discharge permit (air)

- RM20.360.04 Bore (land use consent)

The reasons for this review clause are*:*

- In the case of a water take, to vary the quantities, monitoring, operating and reporting requirements, and performance standards in order to take account of information, including the results of previous monitoring and changed environmental knowledge, on:
  - actual and potential water use ;
  - groundwater levels;
  - stream water flow and level regimes;
  - groundwater quality;
  - efficiency of water use;
  - Instream biota, including fish passage and the functioning of aquatic ecosystems.
- To deal with any adverse effect on the environment which may arise or potentially arise from the exercise of this consent and which it is appropriate to deal with at a later stage, in particular adverse groundwater quality and neighbouring groundwater users.
- In the case of a discharge permit to do something which would otherwise contravene section 15 or 15B of the RMA, to require the adoption of the best practicable option to remove or reduce any adverse effects on the environment, in particular adverse effects on groundwater quality, effects on human health, plants and animals, nuisance, and amenity.
- In the case of a need to alter monitoring requirements as a result of ongoing monitoring outcomes.

Appendix 1: Recommended Conditions of Consent

Appendix 2: Technical review by E3 Scientific

Appendix 3: Technical review by NZ Air

Appendix 1: Recommended Conditions of Consent

Appendix 1: Recommended Conditions of Resource Consents

RM20.360.01: Water Permit

WATER PERMIT
Pursuant to Section 104B of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name: Cromwell Certified Concrete Limited
Address: 810 Great South Road, Penrose, Auckland 1061
Activity: To take and use ground water for the purpose of gravel washing and dust suppression
Term: 15 years
Location: 1248 Luggate-Cromwell Road (State Highway 6)
Legal Description of land at point of abstraction: Lot 8 DP 301379
Legal Description of land where water is to be used: Lots 5 and 8 DP 301379
Map Reference at point of abstraction: Bore G41/0127 - NZTM 2000 E1305397 N5017068
Bore G41/0456 - NZTM 2000 E1305502 N5017223

Conditions:

1. This permit must not be exercised until Water Permit RM16.108.01 either expires or is surrendered.

2. If this consent is not given effect to within a period of five years from the date of commencement of this consent, this consent must lapse under Section 125 of the Resource Management Act 1991. The consent must attach to the land to which it relates.

3. The rate of abstraction must not exceed:
   a. A combined rate of 46 litres per second from bore G41/0127 and bore G41/0456;
   b. 1,620 cubic metres per day;
   c. 50,220 cubic metres per month; and
   d. 453,600 cubic metres per year.

4. This permit must be exercised in conjunction with Discharge Permit RM16.108.02 or its replacement.

5. The consent holder must:
   a. Maintain the existing water meter(s) to record the water take, within an error accuracy range of +/- 5% over the meter(s) nominal flow range, and a telemetry compatible datalogger with at least 24 months data storage and a telemetry unit to record the rate and volume of take, and the date and time this water was taken.
   b. The datalogger must record the date, time and flow in litres per second.
   c. Data must be provided once daily to the Consent Authority by means of telemetry. The consent holder must ensure data compatibility with the Consent Authority's time-series database.
   d. The consent holder must ensure the full operation of the water meter(s), datalogger and telemetry unit at all times during the exercise of this consent. All malfunctions of the water meter and/or datalogger and/or telemetry unit during the exercise of this consent must be reported to the Consent Authority within 5 working days of observation and appropriate repairs must be performed within 5

working days. Once the malfunction has been remedied, a Water Measuring Device Verification Form completed with photographic evidence must be submitted to the Consent Authority within 5 working days of the completion of repairs.

e. The water meter(s), datalogger and telemetry unit must be verified for accuracy within one month from the first exercise of this consent.
f. Any electromagnetic or ultrasonic flow meter must be verified for accuracy every five years from the first exercise of this consent.
g. Each verification must be undertaken by a Consent Authority approved operator and a Water Measuring Device Verification Form must be completed and submitted to the Consent Authority with receipts of service within 5 working days of the verification being performed, and at any time upon request.

6. The consent holder must take all practicable steps to ensure that:
   a. There is no leakage from pipes and structures;
   b. There is no runoff of irrigation water either on site or off site.
   c. A back flow preventer device is fitted to prevent any contaminants from being drawn into the source of the water.

7. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent for the purpose of imposing aquifer restriction levels, if and when an operative regional plan sets aquifer restriction levels.

8. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within 3 months of each anniversary of the commencement of this consent for the purpose of:
   a. Adjusting the consented rate or volume of water under Condition 3, should monitoring under Condition 5 or future changes in water use indicate that the consented rate or volume is not able to be fully utilised; or
   b. Determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; or
   c. Ensuring the conditions of this consent are consistent with any National Environmental Standard or National Planning Standard.

RM20.360.02: Discharge Permit

Pursuant to Section 104B of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name: Cromwell Certified Concrete Limited
Address: 810 Great South Road, Penrose, Auckland 1061
Activity: To discharge contaminants to land for the purpose of gravel washing and dust suppression
Term: 15 years
Location of consent activity: 1248 Luggate-Cromwell Road (State Highway 6)
Legal description of consent location: Lots 5 and 8 DP 301379
Conditions:

1. This permit is granted in general accordance with the plans and information provided with the application with the discharge of contaminants being sediment in the existing settlement pond in the north-western corner of the site.

2. This permit must be exercised in conjunction with Water Permit RM20.360.01 or its replacement.

3. The volume of water discharged must not exceed:
   a. 1,620 cubic metres per day;
   b. 50,220 cubic metres per month; and
   c. 453,600 cubic metres per year.

4. No contaminants other than silt and sediment must be discharged into the Pisa Groundwater Management Zone.

5. Settlement ponds must be maintained in an efficient operating condition at all times, including at least:
   a. Three monthly inspections of settling ponds; and
   b. Pond desludging as necessary.

6. The consent holder must ensure that there is no direct discharge to any surface watercourse.

7. Quarterly monitoring of suspended sediment concentrations must be undertaken at bore G41/0456 and at up-gradient bore G41/0220 for the purpose of comparison. If 20 consecutive results show no statistically significant difference in results for all three variables then the frequency of testing must reduce to zero.

8. The sampling method to monitor suspended sediment concentrations should be nonintrusive, to ensure that sediment is not re-suspended during sampling or that down gradient clean water is not brought into the bore in a manner that could cause dilution.

9. The consent holder must ensure that the discharge authorised by this consent does not cause any flooding, erosion, scouring, land instability or damage to any adjacent property.

10. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within 3 months of each anniversary of the commencement of this consent for the purpose of:

a. Adjusting the consented rate of discharge under condition 2, should future changes in water use indicate that the consented rate approved under Water Permit RM20.360.01 is not able to be fully utilised; or
b. Determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; or
c. Ensuring the conditions of this consent are consistent with any National Environmental Standards.

RM20.360.03: Discharge Permit

Pursuant to Section 104B of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name: Cromwell Certified Concrete Limited
Address: 810 Great South Road, Penrose, Auckland 1061
Activity: To discharge contaminants to air for the purpose of operating an alluvial quarry
Term: 15 years
Location of consent activity: 1248 Luggate-Cromwell Road (State Highway 6)
Legal Description of consent location: Lots 5 and 8 DP 301379

General Conditions

1. The discharge of contaminants to air must be in general accordance with the information provided with the application that is related to extraction and processing activities on the quarry site, including stockpiling and the ancillary operations of transporting aggregate within the site.

2. If this consent is not given effect to within a period of five years from the date of commencement of this consent, this consent must lapse under Section 125 of the Resource Management Act 1991. The consent must attach to the land to which it relates.

3. Aggregate extracted from the site must not exceed 200,000 cubic metres in any 12-month period.

4. The discharge must not cause dust or the deposition of particulate matter that causes noxious, dangerous, offensive, or objectionable effect beyond the boundary of the site.

5. The Quarry Manager or another nominated person, must be available at all times (including outside quarry operation hours) to respond to dust emission complaints and issues in accordance with measures described in the Dust Management Plan (DMP).

6. The maximum area of unconsolidated land comprising of the excavation area, backfilling areas and rehabilitation area must not exceed two hectares.

Advice Note: The maximum area of unconsolidated land does not include the haul roads, processing area, stockpiles, portacoms or workshop.

Dust Management Plan (DMP)

7. At least 20 working days prior to the commencement of quarry activities, the Consent Holder must prepare a Dust Management Plan (DMP) for the certification of the Consent Authority.

8. Works must not commence until the Consent Holder has received written certification of the DMP. Notwithstanding this, the works may proceed if the Consent Holder has not received a response from the Consent Authority within 10 working days of the date of the submission of the DMP.

9. The DMP must include, but not be limited to:
   a. A description of the purpose of the DMP;
   b. A description of the dust sources on site;

c. A description of the receiving environment and identification of sensitive receptors within 250 metres of site boundaries;
d. The methods (including dust reduction through design methodologies), which will be employed as necessary to ensure compliance with the conditions of this consent;
e. A description of site rehabilitation methodology and associated dust control measures;
f. A description of particulate matter and wind monitoring requirements including:
    i. The location of the wind monitoring station;
    ii. The location of permanent and mobile particulate matter monitors between active work areas within the quarry and sensitive off-site activities;

    Details of wind speed trigger levels as set out in Condition 10 and associated alarm system. This must account for the concurrent wind direction as measured in accordance with Conditions 15 and 16;
    iii. Details of the particulate matter trigger levels as set out in Condition 10 and associated alarm system; and
    iv. Monitoring instrumentation methodology, setup requirements, maintenance and calibration procedures;
g. A description of procedures for responding to dust and wind condition-based trigger levels and associated follow up investigations, actions and recording of findings;
h. A system for training employees and contractors to make them aware of the requirements of the DMP;
i. Names and contact details of staff responsible for implementing and reviewing the DMP in order to achieve the requirements of this consent, and procedures, processes and methods for managing dust outside of standard operating hours;
j. A method for recording and responding to complaints from the public;
k. A maintenance and calibration schedule for meteorological and particulate matter monitoring instruments;
l. Contingency measures for responding to dust suppression equipment malfunction or failures, including wind and particulate matter monitoring instruments.
m. Separate Standard Operating Procedures (SOPs) dedicated to the management of potential dust discharges from specific sources, including but not limited to:
    i. Stockpiles;
    ii. (Site roads – sealed and unsealed;
    iii. Triggers for the increased use of water for dust suppression methods;
    iv. The use of dust suppressants in conjunction with water;
    v. Aggregate excavation and backfilling areas;
    vi. Topsoil and overburden stripping and stockpiling;
    vii. Bund construction, maintenance and the recontouring of slopes during rehabilitation;
    viii. Any automated dust suppression for areas prone to dust erosion that can be activated outside of working hours;
    ix. Location and calibration of ambient particulate concentration and meteorological monitoring equipment;
n. Environmental information management for recording, quality assurance, archiving and reporting all data required for dust management of the site.

Advice Note: For the purpose of this consent, sensitive receptor means:

a. Residential dwellings and associated private property, including the area within 20m of the façade of an occupied dwelling;
b. Public roads;

c. Areas of significant indigenous vegetation and significant habitats of indigenous fauna; and
d. Commercially important or sensitive plants, crops or farming systems

Trigger Levels and Dust Mitigation

Trigger Levels

10. Quarry activities (except dust suppression measures) within 250 metres of a sensitive receptor location must not be undertaken when:
    a. Wind speed reaches or exceeds 7 m/s (1-hour average);
    b. Quarry activities would be directly upwind of a sensitive receptor (10-minute average wind direction); and
    c. Less than 1 mm of rain has fallen during the preceding 12 hours.

11. Any quarry activities (except dust suppression measures), which are upwind of any real time dust monitor (as specified in Conditions 18 to 23), must cease when the monitor records PM10 concentrations, which are ≥ 150 micrograms per cubic metre (µg/m3), as a 1-hour average, which is updated every ten minutes. The quarry activities must only recommence following the implementation of effective dust mitigation which achieves compliance with Condition 10.

12. Any quarry activities (except dust suppression measures), which are upwind of any real time dust monitor (as specified in Conditions 18 to 23), must cease when the monitor records any of the following:

    a. PM10 concentrations, which are ≥ 150 micrograms per cubic metre (µg/m3), as a 1-hour average, which is updated every ten minutes;
    b. TSP concentrations, which≥ 250 micrograms per cubic metre (µg/m3), as a 5 minute average;
    c. TSP concentrations, which≥ 200 micrograms per cubic metre (µg/m3), as a 1-hour average, which is updated every ten minutes; or
    d. TSP concentrations, which≥ 60 micrograms per cubic metre (µg/m3), as a 24-hour average, which is updated every ten minutes.

    The quarry activities must only recommence following the implementation of effective dust mitigation which achieves compliance with Condition 10.

13. If at any time, including outside normal operating hours, visible dust is blowing beyond the site boundary the Consent Holder must:
    e. Immediately investigate, identify and cease all quarry activities (except dust suppression measures and vehicle movements along the site access road), which are causing the visible dust blowing beyond the site boundary;
    f. Confirm that automated dust suppression water systems are working and immediately implement additional dust suppression measures, which target the identified areas causing the dust event;
    g. Only resume quarry activities (other than dust suppression) once there is no longer visible dust blowing beyond the site boundaries and there are no breaches of Conditions 10 and 11; and
    h. Notify the Consent Authority as soon as practicable, detailing the cause of the dust event (including any off-site sources) and the dust suppression actions undertaken.

14. If the investigation required under Condition 12(a) determines the source of dust is localised to the excavation area only and is only impacting on areas downwind of this source, then activities within the central processing area, including sales of product

can continue. This is contingent on all activities within the existing processing and load out area to be not causing visible dust blowing beyond the site boundary and their downwind real time PM10 monitors not reaching or exceeding the trigger in Condition 11.

Mitigation Measures

15. The Consent Holder must take all reasonably practicable measures to minimise the discharge of dust from quarry activities, including but not limited to:
    a. Assessing weather and ground conditions (wind and dryness) at the start of each day and ensure that applicable dust mitigation measures and methods are ready for use prior to commencing quarry activities;
    b. Taking wind direction and speed into account in planning quarry activities to minimise the risk of dust dispersion towards any residential dwellings that are within 250 metres of the site boundary;
    c. Water suppression such as using water carts or fixed sprinklers will be applied as required to dampen down unpaved areas and stockpiles, which are prone to generate dust. This must occur during dry weather, irrespective of wind speed;
    d. Carrying out topsoil and overburden stripping and land rehabilitation during winter months when ground conditions are damp and winds are below 7 m/s;
    e. Pre-dampening topsoil and overburden, if necessary, with a water cart or sprinklers prior to its stripping and removal.
    f. Constructing and maintaining unsealed internal haul roads so that their surfaces consist of a crushed clean aggregate layer that is free of potholes;
    g. Minimising drop heights when loading trucks and when moving material;
    h. Operating fixed and mobile crushing plant in conjunction with water dust suppression (either sprays or high-pressure fogging system) as necessary to avoid the dust trigger level, as specified in Condition 16, being reached or exceeded;
    i. Undertaking routine onsite and offsite inspections of visible dust emissions and deposited dust throughout each day of quarry activities and electronically logging findings and any dust suppression actions, and to make the results of the inspections available to the Consent Authority when requested;
    j. Maintaining an adequate supply of water and equipment on site for the purpose of dust suppression at all times;
    k. Imposing a speed restriction on all internal haul and access roads to 30 kilometres per hour if these are either sealed or constructed from crushed clean aggregate;
    l. Sealing the first 50 m of the access road from the entrance off Luggate-Cromwell Highway to the site;

Meteorological monitoring

16. Prior to exercising this consent, the Consent Holder must install a meteorological monitoring station at the location described in the DMP. The meteorological monitoring station must be capable of continuously monitoring:
    a. Wind speed and direction at a minimum height of 10 m above the natural ground level; and
    b. Temperature.

17. The meteorological monitoring instruments must:
    a. Measure wind speed as 1-minute scalar averages with maximum resolution of 0.1 metres per second (m/s), have an accuracy of at least within +/-0.2 m/s, and a stall speed no greater than 0.5 m/s;

b. Measure wind direction as 1-minute vector averages with maximum resolution of 1.0 degree and accuracy of at least within +/- 1.0 degree, and a stall speed no greater than 0.5 m/s;
c. Measure screened temperature with accuracy of +/- 0.5 degree;
d. Located on the subject property in accordance with AS/NZS 3580:14-2014 (Methods for sampling and analysis of ambient air – Part 14 Meteorological monitoring for ambient air quality monitoring applications). If the monitoring station cannot be located in accordance with AS/NZS 3580:14-2014 an alternative location must be agreed in writing with the Consent Authority;
e. Maintain a data and time stamped electronic record for at least 36 months of meteorological monitoring results, recorded as rolling 10-minute averages, which are updated every one-minute in real-time.
f. An alarm to the Quarry Manager (for example via mobile phone) must be provided if the rolling average wind speed and downwind trigger levels in Condition 10 are reached or exceeded.
g. Maintained and calibrated in accordance with the manufacturer's specifications.

18. All meteorological monitoring data must be made available to the Consent Authority on request.

Particulate Matter Monitoring

19. Prior to exercising of this consent, the consent holder must operate and maintain one permanent real-time dust management monitor for continuous monitoring of ambient 10-minute average PM10 concentrations, which is installed and operated at a fixed location at the existing quarry's southwest boundary and in accordance with the DMP.

Advice Note: The permanently located real-time dust management monitor must be an accepted method for general dust management/monitoring purposes, and does not need to be a certified US EPA, or National Environmental Standards for Air Quality (NESAQ) compliant method.

20. The permanent monitor must be installed, operated, maintained and calibrated in accordance with the AS/NZS 3580.12.1:2015 *Methods for sampling and analysis of ambient air - Determination of light scattering - Integrating nephelometer method*, or else an equivalent, or superior standard which is approved by the Consent Authority;

21. Prior to the exercising of this consent, the consent holder must operate and maintain two mobile real-time dust management monitors for continuous monitoring of ambient ten-minute average PM10 concentrations, whose location changes for different stages of the quarry development and in accordance with the DMP.

22. The mobile real-time dust management monitors can be equivalent to that used for the permanently located dust monitor, or else be a lower cost method, on the basis that this can be effectively calibrated against the permanent dust monitor (i.e. the mobile units must be able to be able to maintain a calibrated accuracy of +/- 5% from the AS/NZS compliant instrumentation).

23. The two mobile dust monitors must be positioned at different site boundary locations, such that real-time dust monitoring is undertaken at locations, which are between active dust sources and downwind sensitive receptor locations, when the latter are within 250 m of the dust source, as described in the DMP.

24. Other general requirement for all three dust monitors includes the following:

a. Sited in general accordance with AS/NZS 3580.1.1:2016 Methods for sampling and analysis of air - Guide to siting air monitoring equipment;
b. Have a GPS location service (or similar technology) which enables their locations to be remotely monitored and recorded.
c. Able to provide and record the results continuously using an electronic data logging system with an averaging time for each parameter of not more than one minutes;
d. Able to record monitoring PM10 concentrations in real-time as rolling 1-houraverages, updated every 10-minutes in an appropriate electronic format;
e. Fitted with an alarm system that is able to send warnings and alerts to the Quarry Manager or other nominated person; and
f. Maintained in accordance with the manufacturer's specifications.

Bund formation

25. When constructing the bunds, the following controls apply:
    a. Wherever possible the bunds must be constructed during winter months (1st May to 1st September);
    b. Maintain a buffer distance of 250 m when wind speeds are above 7 m/s in a direction towards the nearest sensitive locations;
    c. Material to be excavated must be thoroughly wetted using a water cart, if not already damp, ahead of excavation and wetted thoroughly thereafter;
    d. Wind monitoring must be carried out and dust generating activities must cease when the wind is blowing towards sensitive locations and the wind speeds exceed 7 m/s (hourly average) in accordance with Condition 10;
    e. Vegetated cover must be established as soon as practicable and maintained to ensure healthy cover during dry months.

Complaints Register

26. The Consent Holder must maintain a Complaints Register for any complaints received. The Complaints Register must include:
    a. The date and time the complaint was received;
    b. The nature and location of where the complaint has originated, if provided;
    c. A summary of the complaint;
    d. Particulate matter and wind conditions at the time the when the dust was observed by the complainant; and
    e. Any corrective action undertaken by the Consent Holder to avoid, remedy or mitigate the issue raised.

27. The Complaints Register must be provided to the Consent Authority on request.

Review

26. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within 3 months of each anniversary of the commencement of this consent for the purpose of:
    a. To deal with any adverse effect on the environment which may arise from the exercise of the consent that was not foreseen at the time of granting of the consent, and which is therefore more appropriate to deal with at a later stage; and/or
    b. To require the Consent Holder to adopt the best practicable option to reduce any adverse effects on the environment resulting from the activity; and/or

c. Ensuring the conditions of this consent are consistent with any National Environmental Standard or National Planning Standard.

RM20.360.04: Land Use Consent (Bore)

Pursuant to Section 104A of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name: Cromwell Certified Concrete Limited
Address: 810 Great South Road, Penrose, Auckland 1061
Activity: To construct a bore for the purpose of excavating gravel below groundwater
Term: For an unlimited term
Location of consent activity: 1248 Luggate-Cromwell Road (State Highway 6)
Legal description of consent location: Lot 8 DP 301379

Conditions:

1. The bore must be an open excavation on Lot 8 DP 301379 in general accordance with the plans and information provided with the application.

2. If this consent is not given effect to within a period of five years from the date of commencement of this consent, this consent must lapse under Section 125 of the Resource Management Act 1991. The consent must attach to the land to which it relates.

3. The consent holder must take water samples quarterly from bores G41/0456 and G41/0111 (approximately 660 metres east of the intersection of Luggate-Cromwell Road (State Highway 6) and Amisfield Road) on the same day. The samples must be analysed by a laboratory with IANZ accreditation or equivalent for:
    a. *Escherichia coli* (cfu/100ml);
    b. Suspended Solids (g/m3); and
    c. Total Petroleum Hydrocarbons (g/m3).
    d. If 20 consecutive results show no statistically significant difference in results for all three variables then the frequency of testing must reduce to zero.

4. Copies of the results of the water quality analyses outlined in Condition 3 must be forwarded to the Consent Authority within two months of the sampling.

5. The consent holder must ensure all water samples are taken by a suitably trained person.

6. Should the measured value of any of the parameters outlined in Condition 3 above exceed a NZ Drinking Water Standard Maximum Acceptable Value, then the consent holder must:
    a. Advise the Consent Authority within 48 hours of receipt of the results;
    b. As soon as practicable, begin an investigation into the cause of the elevated sample results. The investigation is to include, but is not limited to; activities at Amisfield Quarry, activities at the neighbouring property, rainfall in the past 48 hours, and any additional water quality monitoring;
    c. Within one month of receipt of the elevated sample results, submit a report to the Consent Authority on the investigation undertaken, any potential sources of contamination identified, and any remedial measures that must be undertaken to mitigate any adverse environmental effects.

Advice Note: The Guideline Values and Maximum Acceptable Values (MAV) are taken from the publication 'Drinking-water Standards for New Zealand 2005 (Revised 2018)', Ministry of Health. The Guideline Values are the limits for aesthetic determinants that, if exceeded, may render the water unattractive to consumers.

7. Any erosion, scour or instability of the bed or banks of the pit or formed waterbody that exceeds the extent shown in the consent application must be reinstated or remedied by the consent holder to a standard, and within a timeframe, to the satisfaction of the Consent Authority.

8. The consent holder must take all necessary precautions to prevent any discharge of contaminants to the pit or formed waterbody, other than silt/sediment in stormwater runoff and/or runoff from gravel washing.

9. In the event of a discharge of unauthorised contaminant(s) to water or to land in a manner that may enter water, including but not limited to fuel, hydraulic fluid, overspray of weed killer, contaminated soil or leachate, the consent holder must:
    a. Undertake all practicable measures as soon as possible to contain the contaminant
    b. Ensure that the contaminants and any material used to contain it are removed from the site and disposed of at an authorised landfill
    c. Immediately notify the Consent Authority of the spill or contamination and of the actions taken to remediate and mitigate any adverse environmental effects
    d. If requested, undertake water quality sampling and any other actions necessary to remediate or mitigate any adverse effects on the environment, to the satisfaction of the Consent Authority.

10. The consent holder must ensure that:
    a. All machinery to be operated on the site (excluding trucks) is thoroughly cleaned of vegetation (e.g. weeds), seeds or contaminants at least 10 metres away from any waterbody, water flow channel or stormwater system, prior to entering the site
    b. All machinery must be regularly maintained in such a manner to ensure no contaminants (including but not limited to oil, petrol, diesel, hydraulic fluid) must be released into water, or to land where it may enter water, from equipment being used for the works.
    c. All contaminant storage or re-fuelling areas are bunded or contained in such a manner so as to prevent the discharge of contaminants to water or to land where it may enter water.
    d. No machinery is cleaned, stored or refuelled within 10 metres of any waterbody, water flow channel or stormwater system.

11. If koiwi, taonga or other archaeological material is discovered in any area during the works, work must immediately cease and the consent holder must contact Aukaha, Heritage New Zealand and Otago Regional Council within twenty-four hours. If human remains are found, the New Zealand Police must also be contacted. The consent holder must allow the above parties to inspect the site and in consultation with them, identify what needs to occur before work can resume.

12. The consent holder must maintain a permanent record of any complaints received alleging adverse effects from or related to the works. This record must include:
    a. The name and address of the complainant (if provided);
    b. The date and time that the complaint was received;
    c. Details of the alleged event;
    d. Weather conditions at the time of the complaint; and
    e. Any measures taken to mitigate/remedy the cause of the complaint.

    This record must be made available to the Consent Authority on request.

13. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within 3 months of each anniversary of the commencement of this consent for the purpose of:
    a. Adjusting the variables or frequency of the sampling requirements under Condition 3; or
    b. Determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; or
    c. Ensuring the conditions of this consent are consistent with any National Environmental Standard or National Planning Standard.

Appendix 2: Technical review by E3 Scientific

Ref: 20028.30
11 November 2020

Sarah Davidson
Senior Consents Officer
Otago Regional Council

By email: sarah.davidson@orc.govt.nz

Dear Sarah,

RE: RM20.360 Cromwell Certified Concrete Groundwater Take Effects Assessment Review

1 Introduction

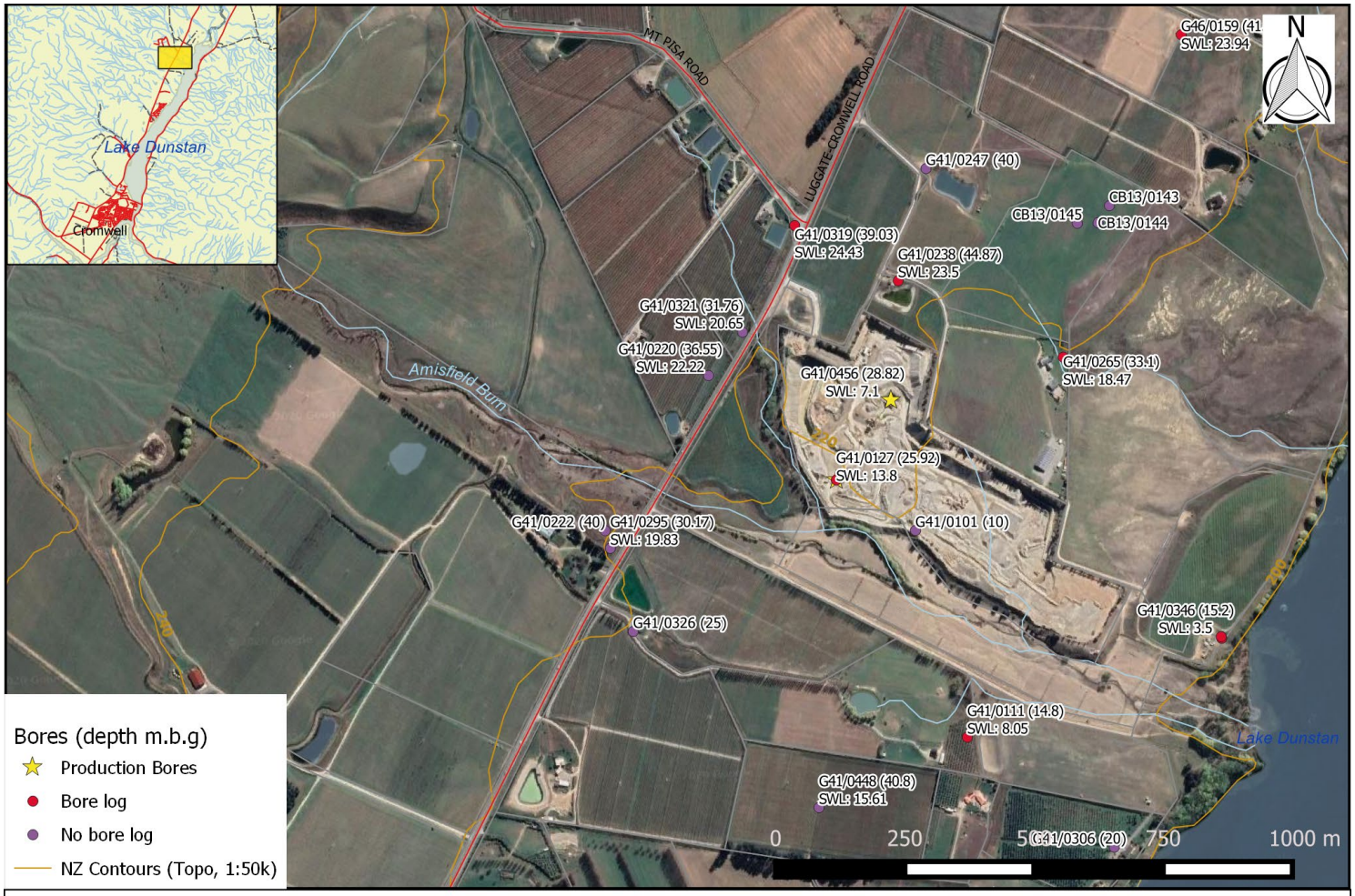
Cromwell Certified Concrete has applied for resource consent to take groundwater from an existing bores (G41/0127 and G41/0456) at 1248 Luggate-Cromwell Road, Cromwell (Figure 1) for the purpose of quarry operations (gravel washing, dust suppression and irrigation) at the following rate:

Maximum rate of take: 70 l/s
Maximum daily volume: 3024 m^3/day
Maximum annual volume: 846,720 m^3/year

The consent will replace water permit RM16.108.01 which is due to expire in 2036. The current consent allows for abstraction at a maximum rate of 46 L/s to a total of 453,600 m^3/year. The applicant has proposed a condition of consent limiting the rate of abstraction from bore G41/0127 to 23 l/s and 47 l/s from bore G41/0456.

The proposed groundwater take is from the Pisa Groundwater Management Zone.

Figure 1: Groundwater standing water levels and bore locations



NZ Contours, NZ Road Centre line (Electoral), NZ River Polygons (Topo, 1:50k), NZ Lake Polygons (Topo, 1:50k), NZ River Centrelines (Topo, 1:50k) sourced from the LINZ Data Service http://data.linz.govt.nz/ and licensed by LINZ for re-use under the Creative Commons Attribution 4.0 New Zealand licence.
Aerial Imagery sourced from the Google Satellite.

1.1 Scope of Work

The scope of this work is to provide an audit of the Assessment of Environmental Effect answering the following questions:

- Is the technical information provided in support of the application robust, including being clear about uncertainties and any assumptions? Yes, or no. If not, what are the flaws?
- Does the application appropriately identify affected water bodies? Yes/no.
- Is the description of the groundwater and surface water attributes potentially affected by the activity accurate (e.g. aquifer properties, depth to groundwater, groundwater flow direction)?
- Have the effects on groundwater quality, effects on neighbouring bores, effects on stream depletion been appropriately assessed? Please include details on the appropriateness of the method of assessment.
- Have the cumulative effects of the activity been appropriately assessed? Yes/no
- If granted, are there any specific conditions that should be included in the consent? Please outline recommendations for changes to standard conditions and/all non-standard conditions that may be relevant.
- If monitoring of water quality is required, where should monitoring be undertaken, what parameters should be monitored and how often? Yes/no
- Is there any groundwater reason the consent term should be shorter than applied for?

The scope does not include assessing reasonable and efficient use of water or historical water use.

Data reviewed to support this assessment includes:

- Landpro (2020). Assessment of the Effects of Increased Water Take at Amisfield Quarry.
- Henderson, R. (2016) ORC Staff Recommending report RM16.108.01-02. Dated 20/06/2016
- Bore logs in 2 km radius
- Bore construction data in 2 km radius

2 Aquifer characteristics

The applicant has identified the bores as being located within the Pisa Groundwater Management Zone. This zone was not identified in the current Regional Water Plan or any of its schedules, but has been identified in the draft/recommended aquifers on the ORC Water Allocation for Consultants webpage. Groundwater levels in the surrounding bores at the time of drilling are shown in Figure 1. Groundwater beneath the site flows east through the alluvial terraces towards Lake Dunstan.

e3s examined the bore logs from nearby bores to assess the likely aquifer thickness and permeability. No basement rock was found in nearby bores, however there was clay at the base of G41/0319 and claybound gravels at 30 m.b.g. in G41/0465 at 40 m.b.g., which may function as the base of the aquifer. This indicates the saturated thickness of the aquifer may be 10-15 m.

2.1 Pumping Test

An eight-hour pumping test was completed on bore G41/0455 in 2015, pumping at a rate of 25 l/s. This resulted in drawdown of 2.2 m within the pumping bore. PDP interpreted these results to indicate that the transmissivity was 1,100 m^2/day and the specific yield was 0.1 (Henderson, 2016).

Given that the proposed maximum pumping rate is now 70 l/s (average 35 l/s throughout the day), this pumping test does not comply with the ORC aquifer test requirements. ORC minimum aquifer test requirements to support the resource consent application, as specified in ORC Form 5 Groundwater Take Application, are a 48-hour constant rate pumping test at the maximum rate proposed for the consent for takes greater than 750 m^3/day, and static water levels should be monitored for 24 hours prior to the commencement of the test. In addition, a 4 x 1 hour step test should be completed.

The bore data obtained from ORC (see Table 1 in Section 3.3) indicates that G41/0456 was pumped at 37 l/s for an extended period resulting in a drawdown of 16.59 m. It is therefore possible that a complying pumping test was completed on the bore, however no description or interpretation of this test has been included in the assessment. Interpretation of this test should be included to provide appropriate aquifer parameters for this assessment.

2.2 Bore characteristics

The two bores are 25-30 m deep and located within the quarry pit.

3 Assessment of Environmental Effects

3.1 Return flows

The previous recommending report documented the assumption that only 30% of the water take was consumptive, and the rest of the take was non-consumptive as it was returned to the groundwater via the soakage pits. However, the stated water use is for gravel washing, dust suppression and irrigation, and potable use. There is no breakdown of the different uses in the assessment of effects, therefore it is difficult to verify the likely percentage of consumptive use. It is unknown what area is irrigated, or what the potable demand is for the site, or how much is used for the wash pad.

For example, Appendix 4, assessment of potential effects of dust discharges indicates that up to 8.3 l/s may be required for dust suppression (based on 1 L/m^2/hour on 3 ha of active working). It is unlikely that there would be a much return flow from this dust suppression as it would only be spread at a depth of 1 mm each hour.

In addition, it would be helpful to identify and describe the operation of the soakage pits more clearly, as evaporative losses from the pits may be significant, especially during the summer season.

3.2 Depletion of Nearby Watercourses

The applicant has identified the Amisfield Burn (130 m) and one of its tributaries (50 m) as the closest surface water courses, with Lake Dunstan situated 800 m to the east.

Landpro (2020) state that the Amisfield Burn is approximately 20 m above the groundwater table, and therefore disconnected from groundwater. The groundwater standing levels are presented in Figure 1. The standing water levels

demonstrate that the Amisfield Burn is likely to be disconnected from groundwater at its closest point to the monitoring bores, however, as the Burn flows towards Lake Dunstan, the depth to groundwater decreases and it may become connected to groundwater. The Amisfield Burn is identified in Schedule 1A of the Regional Water Plan as providing habitat to koaro which has a threat status of 'declining'. Given that the Burn has been identified as important spawning habitat, it is important to maintain connectivity between the Burn and the Lake. The applicant should provide further assessment of the potential for the increased groundwater take to impact the flow further downstream in the Burn.

Lake Dunstan is connected to the Pisa Groundwater Management Zone. The applicant has observed that water levels in the mine pit pond fluctuate in response to changes in the water level in Lake Dunstan. The taking of up to 1000 m^3/day, at a maximum rate of take of 100 l/s from Lake Dunstan is a permitted activity according to Rule 12.1.2.2 of the Regional Water Plan (ORC, 2016). Given that the pumping rate will be less than 100 l/s, the take cannot exceed this amount, however, it could be possible for the daily limit to be exceeded, and this therefore needs to be assessed.

3.3 Bore Interference

The Regional Water Plan specifies information required to be submitted in conjunction with the resource consent (16.3.1) specific to the taking of groundwater, which includes calculation of bore interference according to Schedule 5B. This schedule states that the method presented is for calculating bore interference for new[i] groundwater takes.

Landpro (2020) provided an assessment of bore interference based on two scenarios a) where only 37% of the take is consumptive, and 63% is returned to the aquifer through soakage pits; and b) the worst case scenario whereby no water is returned to the aquifer. They also noted that Lake Dunstan would provide a recharge boundary, but did not quantitatively assess the likely effect of that boundary.

[i] The previous effects of the groundwater take may be considered part of the existing landscape, however any additional drawdown caused by the increase in groundwater take cannot be considered as such.

As the aquifer is unconfined, interference is considered significant if the groundwater take induces 0.2 m of drawdown in a neighbouring bore (ORC, 2016) as per Schedule 5B.

Landpro (2020) assessed drawdown caused by the take using the aquifer parameters used in the previous recommending report from the short duration pumping test on G41/0455. Results from this assessment indicated that bore interference may be in excess of the significance criteria determined by ORC. However, they made a case for the drawdown not being significant due to the available drawdown in the neighbouring wells and using the approach currently used in Canterbury that requires the protection of available drawdown i.e. drawdown is significant if it exceeds 20% of the available drawdown. They have assumed that the drawdown may only be 4% of the available drawdown and this should therefore be considered acceptable.

The neighbouring bores (within a radius closer than the Lake) and their available drawdown are provided in Table 1. It should also be noted that many of the bores have groundwater takes associated, and it is unclear what the cumulative effect of these drawdowns may be on the available drawdown. Regardless of this, the significance of bore interference must be determined based on the provisions of the current Regional Water Plan for Otago, and therefore if there is significant interference likely, affected party approval should be obtained.

Table 1: Neighbouring Bores

Well Number	Owner	Take Consent	Depth	SWL (m.b.g.)	DrillDate	Drawdown	PumpRate	Pump Duration	ScreenFrom	ScreenTo	Available Drawdown (m)	Distance to G41/0127 (m)	Distance to G41/0465 (m)
G41/0101	Cromwell Certified Concrete Limited	2004.294.V1	10	0	1/09/1994		1296					182	257
G41/0111	MCTAINSH D		14.8	8.05	22/08/1995		114.9				3.75	559	669
G41/0127	Cromwell Certified Concrete Limited	RM16.108.01	25.92	13.8	16/09/1995		1296				9.12	0	187
G41/0220	Montero, J	2010.152.V1	36.55	22.22	17/11/2000	6.29	864	360	33.54	36.55	11.32	319	356
G41/0222	Hay R J Hay G J		40	0	12/01/2000		864					458	608
G41/0238	Prophets Rock Vineyard	2001.831	44.87	23.5	30/07/2001	1.75	13	330	41.76	44.76	18.26	404	231
G41/0265	Walnut Ridge Ltd		33.1	18.47	25/05/2002	0.33	112.32				11.63	499	344
G41/0295	Amisfield Farm Ltd	2003.363	30.17	19.83	20/09/2004	1.83	1771				7.34	457	614
G41/0321	Winslow Properties Ltd	RM14.211.02	31.76	20.65	6/03/2007	5.32	1641.6	150			8.11	339	316
G41/0326	Amisfield Road Partnership	RM12.514.01.V	25	0	1/10/2004		121					491	670
G41/0340	Stevinson D		15.2	3.5	15/12/2005	0.28	475				8.7	806	789
G41/0346	Dean Stevenson NZ Ventures LLC	2006.036	15.2	3.5	15/12/2005	0.28	475.2	90			8.7	804	787
G41/0456	Cromwell Certified Concrete Limited	RM16.108.01	28.82	7.1	19/11/2015	16.59	2203.2	4800	27.82	38.82	20.72	187	0

* The available drawdown doesn't include the depth required for a pump above the screen, and simply assumes a 3 m screen where it is not specified i.e . the available drawdown may be 1 – 2 m less.

3.4 Potential for contamination

The applicant holds Discharge permit RM16.108.02 to discharge contaminants to land for the purpose of gravel washing and dust suppression. The AEE (Section 5.9) states that quarterly monitoring of suspended sediment will continue to be completed in bores G41/0455 and G41/0101 to monitor effects of soakage pit. It states that the monitoring data from these bores indicates that the soakage pits are adequately filtering sediment, however bore G41/0455 is not present in the ORC database or on any of the Landpro maps showing groundwater bores, and Landpro (2020) states in their Appendix 7 groundwater assessment that bore G41/0101 was never drilled and that they have asked ORC to remove it from their database. If the applicant intends to continue monitoring these bores, the existence of these bores and the historical monitoring data should be verified.

The neighbouring site 0.68 km to the south (30 Smiths Way) is listed on the ORC mapping resource as having an verified HAIL site (HAIL.01976.01) due to storage tanks for fuel, chemicals or liquid waste being present on the property (https://maps.orc.govt.nz/portal/apps/MapSeries/index.html?appid=052ba04547d74dc4bf070e8d97fd6819, accessed 11/11/2020).

As there is no known contamination at the site and groundwater is more than 15 m below ground level, contamination movement via groundwater abstraction due to the HAIL site is considered unlikely.

3.5 Allocation availability

The ORC Local Water Allocation - Consultants page (https://maps.orc.govt.nz/OtagoViewer/?map=1c59ff71893d4613a169806198eedafd, accessed 11/11/2020) states that the recommended water allocation for the aquifer is 6,500,000 m^3 and that there is currently 2,215,094 m^3 year available. As the change in requested take is 393,120 m^3/year, the increase will account for 18% of the remaining available allocation. The take will therefore not impact on the sustainability of the aquifer.

4 Summary and Conclusions

The audit of the assessment of effects for the Amisfield Quarry groundwater take in Cromwell can be summarised with the following points:

- There is uncertainty regarding the adequacy of the pumping test data, and the pumping test completed on G41/0456 should be described and interpreted accordingly. This will impact on the assessment of stream depletion and bore interference effects.
- The assessment has identified the closest waterbodies and determined that there will not be an impact. However, there may be connection between the Amisfield Burn and groundwater closer towards Lake Dunstan, which could impact on spawning fish species.
- The impact on Lake Dunstan could possibly exceed the daily permitted take and should be further assessed.
- There is available groundwater allocation to support the groundwater take and therefore the take will not affect aquifer sustainability;
- Aquifer contamination due to the groundwater take is unlikely; however, the return of water through soakage pits may cause some increases to turbidity. The applicant states that monitoring is occurring, but it is unclear if this is actually the case.
- The assessment of bore interference is based on the likelihood of the take only being partially consumptive. It would be helpful to clarify the water demand for the different uses across the site to estimate a realistic return to groundwater from the site.
- The groundwater take may significantly impact on the closest neighbouring groundwater users according to the current Regional Water Plan for Otago criteria.

If you have any questions regarding the information provided in this letter, please contact Alexandra Badenhop on 03 409 8664 or via email at alexandra.badenhop@e3scientific.co.nz

Yours sincerely,

Alexandra Badenhop
Principal Hydrogeologist

5 References

ORC. (2016). *Regional Water Plan: Water for Otago.* Otago Regional Council.

Appendix 3: Technical review by NZ Air

Donovan Van Kekem
Air Quality Consultant
Ph: 021329970
www.nzair.nz

12 January 2021

Dear **Sarah Davidson**

Subject: Preliminary technical air quality review of the proposed Cromwell Certified Concrete Quarry air discharge consent application.

Scope of Works

Otago Regional Council (**ORC**) has received an application from Cromwell Certified Concrete Limited for an application to discharge contaminants to air from proposed quarry operations at Cromwell Certified Concrete's (**CCC**) Amisfield Quarry. ORC has engaged NZ Air Limited (**NZ Air**) to undertake an independent air quality expert review and critically assess the air quality assessment[1] (hereafter referred to as the **AQA**) provided by the applicant's technical experts, Beca Ltd (**Beca**). ORC has requested an audit of the AQA and its conclusions on potential air quality effects on the following three receptors:

- Clark's property, including dwelling;
- Little's Orchard; and
- The Western Vineyards

Note that is a preliminary review only, a selection of bullet points which identify information gaps or matters which need further attention has been provided. The information presented in this letter is based on a brief desktop review of the application and publicly available information only. No site visit has been undertaken by NZ Air.

[1] Beca report titled: *Amisfield Quarry - Technical Assessment of Potential Effects of Dust Discharges*. Dated 22 October 2020

Brief overview of the Application

The AQA prepared by Beca provides a detailed description of the proposed activity, however for context to this review, the proposed activity involves the following:

- CCC propose to expand its quarry footprint by approximately 8 ha (increasing the total quarry footprint to 27 ha).
- CCC also propose to increase the extraction depth to 30 m below ground level (currently the extraction depth is 15 m).
- The extraction rate is also proposed to increase from ~70,000 m^3 per annum to ~200,000 m^3 per annum.

Beca has assessed the following proposed site activities which have the potential to discharge nuisance dust:

- Excavation and stripping of overburden;
- Extraction of gravel;
- Overburden stockpiling;
- Raw and finished material stockpiling;
- Loading and unloading of materials;
- Vehicle movements;
- Crushing and screening of gravel; and
- Backfilling of worked areas.

Dust generated from dry exposed areas has also been assessed.

The existing and proposed excavation areas are illustrated in Figures 2-1 and 2-3 of the Beca AQA. The AQA has assessed potential air quality impacts (both nuisance effects from TSP emissions and potential health effects from PM_{10} and $PM_{2.5}$) at neighbouring properties (illustrated in Figure 2-5 and tabulated in Table 6-1 in the AQA).

The surrounding land use is dominated by fruit growing activities.

Aspects of the AQA for which further information/assessment should be supplied to ascertain the potential level of off-site effects

In NZ Air's professional opinion, the following aspects of the AQA have not been provided or lack sufficient detail to be able to accurately determine the potential for adverse off-site air quality effects:

- The assessment relies heavily on meteorological data measured at the Fulton Hogan Quarry located approximately 2 km south of the site. NZ Air considers that in the absence of on-site meteorological data, the use of this data is appropriate. However, the assessment does not state the height above ground level at which the wind data has been measured. As measured wind speed generally decreases with height above ground level due to the increase in surface friction effects. It is the industry standard to use wind speed and direction measured at 10 m above ground level for the purposes of assessing the potential effects of wind on the dispersion of dust from quarry emissions. If the Fulton Hogan observations are from a lower height (i.e. 6 m above ground level), then the proportion of wind speeds which are higher than 5 m/s (the critical factor used in the risk assessment

approach adopted by Beca) would be higher. The anemometer height needs to be provided such that the conclusions relating to the potential effects can be verified.

- The AQA has not provided the location(s) of material processing equipment on-site. With the proposed increase in material extraction rates (from 70,000 m^3 to 200,00 m^3 annum) it is likely that there will be an increase in product processing (crushing and screening) activities. Product processing activities can have an increased risk of off-site effects. Some product processing activities produce dust with higher proportions of fine dust (PM_{10}), i.e. crushing activities. As such dust from product processing can travel further than that generated from other quarry dust sources. As such it is the industry standard to have larger separation distances between product processing plants and off-site receptors. Therefore, NZ Air consider that the location, size, and processing rates of product processing activities on-site need to be provided and more specific detail on the proposed mitigation measures for each type of product processing plant (i.e. fixed or mobile processing plants) should be provided.
- The AQA also does not identify the proposed location of main haul roads, product stockpiling (of particular interest would be any fine products such as crusher dust or sand), or overburden stockpiling, either within the existing quarry or the proposed expansion area. The scale of the activities at each location has also not been provided.
- Beca has commented on the potential effects of respirable crystalline silica (**RCS**) on off-site effects. Beca has relied on monitoring undertaken in the Yaldhurst monitoring study to determine the potential for off-site effects. NZ Air notes that the silica content in aggregates quarried in Canterbury is likely to be lower than that at CCC. Based on geological surveys of rock types in the South Island, there is a higher proportion of quartz rich rock in Central Otago than in Canterbury[2]. NZ Air considers that it would be pertinent to assess the potential increase in RCS emissions which could occur from quarry activities proposed at CCC's Amisfield quarry (particularly product crushing processes which have a higher potential to discharge RSC). This would be particularly relevant should product processing be proposed to occur within close proximity to neighbouring residential receptors (i.e. the Clark residence).
- It is not clear from the information provided in the AQA whether or not aggregate extraction and subsequent rehabilitation will be staged to limit the amount of exposed/or active working areas. Based on the information provided and current aerial imagery it appears that there is a low proportion of the existing quarry footprint which has been rehabilitated. There is an increased risk of nuisance dust emissions if there is a large area of unconsolidated exposed surfaces.
- The AQA correctly identifies that deposited dust can have adverse ecological effects including effects on cropping operations. The existing and proposed quarries are essentially surrounded by cropping activities. The Ministry for The Environment Good Practise Guide for Assessing and Managing Dust (2016) (**MfE GPG Dust**) describes the potential effects on plants and crops in Section 2.2.5 (reproduced below).

[2] Black, P M. '*South Island Aggregate Inventory – Geological Influences on Materials Properties*' March 2014

Plants and crops

Dust deposits can have significant effects on plant life, though mainly at high dust loadings. This can include:

- reduced photosynthesis due to reduced light penetration to the leaves. This can cause reduced growth rates and plant vigour. It can be especially important for horticultural crops, through reductions in fruit setting, fruit size and sugar levels. It can also lead to reduced forestry yields
- increased incidence of plant pests and diseases. Dust deposits can act as a medium for the growth of fungal diseases. In addition, it appears that sucking and chewing insects are not affected by dust deposits to any great extent, whereas their natural predators are affected
- reduced effectiveness of pesticide sprays due to reduced penetration
- rejection and downgrading of produce due to crop blemishing. Once again, this is a particular issue for horticultural crops
- reduced palatability of pasture and associated reduced yields in terms of dairy productions.

Given the extent and proximity of the existing cropping operations to the existing and proposed CCC quarry operations, NZ Air consideres that a more detailed assessment of potential cumulative effects on adjacent cropping activities should be provided.

- Beca has proposed that a Dust Management Plan (**DMP**) will be produced and that this plan will supply more detailed mitigation methodology. This should be provided with the application such that it can be reviewed to ensure that suitable management measures are proposed to effectively mitigate dust discharges from the site.

Additional mitigation/design considerations which could be considered to reduce the potential for effects

- NZ Air considers that the applicant should consider limiting aggregate processing and storage to central locations on-site, to increase the separation distances between this dust discharging activity and the nearest off-site receptors.
- The applicant has proposed boundary TSP monitoring and associated concentration trigger levels for increasing dust control measures and stop work conditions. It appears that this TSP monitoring is only applicable to residential receptors which are within 100 m of the site boundary. Based on a review of available aerial imagery, it appears that the Clark residence is the only residence which is within 100 m of the boundary. This would mean that TP monitoring would only be required during a very small portion of the proposed quarry works. It is noted that Environment Canterbury requires quarries to undertake continuous TSP monitoring within 500 m of a residential dwelling. Dependent on the results of the assessment of potential cumulative effects on surrounding crops, it may be appropriate to undertake TSP monitoring on boundaries adjacent to cropping land (potentially only during certain seasons).
- The applications states that water will be used for mitigation '*as required*'. Whilst the application states that there will be sufficient water available to control dust emissions from

dust producing activities on-site, the water application infrastructure/number of watercarts which would be required to apply this amount of water (up to 250,000 l/hr) would be substantial. NZ Air considers that there needs to be more detail on how and when water will be used to control dust emissions from the site. Usually, this information would be supplied within a DMP.

- The applicant should consider stipulating minimum separation distances of product processing plants from the site boundaries/sensitive receptors.
- The applicant should consider undertaking staged material excavation and rehabilitation activities to reduce the amount of exposed unconsolidated surfaces. Stipulating a maximum area for active works will also reduce the potential for dust emissions during dry windy conditions. It is common (and good practice) for quarries to undertake staged extraction and progressive backfilling and rehabilitation. Limiting active working/exposed unconsolidated areas to ~2 ha is common. It appears that the majority of the existing 19 ha quarry is exposed and there is very limited rehabilitation which has occurred on-site.
- The proposed weather station should be installed in accordance with AS/NZ 3580.14:2004.
- The applicant could consider providing a larger setback distance between off-site receptors and the proposed boundary bund/excavation area.
- The applicant could consider automated sprinkler systems on the on-site haul roads if these are not already present/proposed.
- The applicant could consider installing a spray bar to wet down the surface of uncovered loads entering and exiting the site.
- The applicant could consider installing a wheel wash on the site exit to limit tracking of material off-site.
- The proposed boundary bunds should be constructed during winter months where the soil moisture content is higher and evapotranspiration rates are lower. Detail on how the boundary bunds will be vegetated and how vegetation of these bunds will be maintained should also be considered.
- The Beca AQA correctly states in Section 4.9 that shelterbelts reduce the potential for dust discharges beyond the site boundary. Whilst NZ Air accepts that there may be limitations to providing planting on the site boundaries, it is considered that this should be investigated further. Boundary planting is considered good practise in the quarry industry. It is noted that there is some boundary planting around the existing quarry. Infill planting along these existing boundaries should be considered as a minimum.

Potential for adverse air quality effects

In summary, the technical assessment of potential air quality effects provided in support of the air discharge consent lacks detail on a number of aspects. Further assessment is required to accurately define the potential for adverse air quality effects.

This site is unique in that it is almost entirely surrounded by cropping activities which are likely to be sensitive to deposited dust. In many instances the separation distances between these cropping activities and the site boundary are small (less than 100 m). As such there are sensitive activities downwind during nearly all wind directions. NZ Air suspects that there will be a higher proportion of windspeeds above 5 m/s at the site that that presented in the report. The site is exposed and there is little established planting (particularly in the immediate vicinity of the proposed expansion area). The local topography is likely to 'funnel' wind in a north/south orientation. In similar topographies strong up valley or down valley winds are common. As such there is a higher potential for off-site adverse effects to occur.

NZ Air is not qualified to comment on the potential for adverse effects on crop growth and yields which may occur should there be an increase in dust deposition on the adjacent cropping activities, but it is considered that without stringent dust mitigation measures, the potential for an increase in dust deposition on these immediately adjacent cropping activities is likely.

Whilst ORC has not received any dust related complaints relating to the historic operations, two complaints were received in October and November 2020. These complaints included photos and video of dust discharges from the existing activity. It is noted that these complaints were made after adjoining residents became aware of the application for consents. Nonetheless the NZ Air has viewed the video supplied. The visible dust emissions (which are alleged to be emitted from the existing operation) are substantive and not consistent with emissions which would be expected from a quarry which is implementing industry standard dust mitigation measures. Note that NZ Air has not been able to verify whether or not this video evidence is in fact video of dust emissions from the CCC quarry or not.

The proposed increase in scale of the operations will require a measured increase in mitigation, particularly if CCC intend to leave all or most of the area proposed to be quarried 'open' and not progressively rehabilitate excavated areas.

Potential effects on Clark's property and dwelling

NZ Air considers that the potential effects on this property are elevated by the fact that there will be/may be quarrying/dust producing activities on three sides of the property which could occur simultaneously. This means that this property could be downwind from dust emitting activities during most wind directions. This increases the frequency and duration of potential dust nuisance effects. The distance between the Clark residence and the nearest proposed extraction area (80 m) is small. Without very stringent dust mitigation measures during works this close to a residential dwelling, there is a high potential for dust discharges to generate nuisance effects on this residence (note that during the Yaldhurst monitoring program there were three exceedances of the MfE PM_{10} nuisance trigger threshold at a monitoring location 80 m from the Yaldhurst quarry zone[3]). NZ Air considers that the most effective mitigation to preventing nuisance dust effects on this residence would be to apply a larger buffer distance between this receptor and on-site activities.

In the AQA additional mitigation is proposed (in Section 7.3) when working within 200 m of the Clark residence. This includes windspeed and TSP trigger levels which include stop work conditions. NZ Air consider that these monitoring triggers are appropriate, but there is a lack in the detail of what '*additional dust control methods*' will be for the '*alert*' triggers.

NZ Air consider that the prevalence of windspeeds above 5 m/s needs to be confirmed by knowing the height of the anemometer at Fulton Hogan. If the measurements are not at 10 m above ground level then there will be a higher proportion of windspeeds above 5 m/s and hence the risk category (calculated using the IAQM risk assessment approach) may change, leading to a higher potential for effects on this property/residence.

Potential effects on Little's Orchard

As discussed earlier, NZ Air considers that the potential effects of dust deposition on neighbouring cropping activities needs to be more thoroughly assessed. As such it is not possible to ascertain the full extent of the potential effects on these properties. However, it is noted that there may be

[3] It is noted that the Yaldhurst quarry zone is a much larger operation that that proposed by CCC, this information is supplied for context only.

instances where the Little's orchards could be downwind when dust producing activities are being undertaken on both the existing and proposed quarry, which could lead to cumulative effects.

Potential effects on the western vineyards

NZ Air considers that there is a reduced potential for adverse effects on the vineyards due west of the existing and proposed CCC quarries. This is primarily due to the fact that theses vineyards are further from the majority of the proposed dust producing activities, and have a low percentage of time when they are downwind from the quarry activities i.e. there is a low percentage of easterly winds. Notwithstanding this, it is still important for the applicant to undertake a high level of dust mitigation, this will include preventing material tracking off-site (the site entrance is directly opposite these vineyards).

It is however noted that there is a vineyard southwest of the existing quarry (on the eastern side of State Highway 6) which is approximately 45 m from the existing quarry boundary (at its closest point). It does not appear that Beca has assessed this cropping activity in the AQA. Parts of this vineyard would be downwind during north easterly winds (which are a dominant wind direction and have a higher proportion of winds above 5 m/s). As such Beca should assess the potential for adverse effects on this receptor.

Summary

In NZ Air's opinion, CCC need to undertake a high level of dust mitigation to ensure that nuisance, ecological, or health based air quality effects do not occur off-site. This is a function of the size and scale of the proposed quarry in conjunction with the small separation distances between the air discharging activities and the nearest sensitive receptors. There is a lack of detail on what these mitigation measures will be and how they will be implemented by site staff on-site (which would usually be presented in a DMP). As such an accurate determination on the potential for adverse effects is not possible.

There are additional design considerations and industry standard mitigation measures that the applicant should consider to reduce the potential for effect.

There is further assessment and detail which is required to accurately determine the potential for off-site effects. However, based on the information supplied, NZ Air considers that there is an elevated potential for adverse off-site effects at the Clark property and residence, the Little orchards, and potentially at the vineyard due southwest of the existing quarry. CCC will need to implement stringent industry standard mitigation measures (including those recommended in this letter) to ensure that the potential for adverse effects to occur beyond the boundary of the site is low.

Closure

If you have any questions about this review, please contact Donovan Van Kekem on 021 329 970.

Yours Sincerely,

Donovan Van Kekem

Managing Director

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Air Quality Consultant
Ph: 021 3299 70
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12 March 2021

Dear **Sarah Davidson**

Subject: Technical air quality review of the Cromwell Certified Concrete Quarry Section 92 response. RM20.360.03

Scope of Works

Otago Regional Council (**ORC**) issued a further information request[1] to Cromwell Certified Concrete Limited (**CCC**) in relation to its application to discharge contaminants to air from proposed quarry operations at its Amisfield Quarry. ORC has engaged NZ Air Limited (**NZ Air**) to undertake an independent air quality expert review of the response[2] (hereafter referred to as the s92 response) provided by the applicant's technical experts, Beca New Zealand Ltd (**Beca**).

Response to Question 1

Beca has supplied the air quality management plan (**AQMP**) as requested. The information and level of detail in the AQMP is consistent with that required in the relevant good practice guides. I am satisfied that the AQMP provides the information which was missing in the original application documents.

In particular, Section 6 details site mitigation measures for discharges of dust from the site and the monitoring program which is proposed. I note that the applicant is proposing to utilise Haul Loc™ and Rubble Loc™ to suppress dust from potential sources during regular operations and out of hours. This adds a level of protection above and beyond traditional water application methods.

The AQMP is structured such that it provides site operators with clear instructions and guidelines to operating the site within the bounds of that presented in the air quality assessment (**AQA**) and s92 response which support the application.

[1] ORC letter dated 21/1/2021 – reference A1434855
[2] Beca Letter titled: RM20.360.03 Amisfield Quarry Response to Request for Further Information. Dated 1/3/2021

Additionally, there are clear triggers which define conditions when site operations and dust discharges are to be reviewed and or restricted when operations are within 100 m of neighbouring sensitive receptors.

Response to Question 2

I agree with Beca that the dust emissions from the quarry will be inert and not result in significant chemical reactions with plant leaves/fruit which would result in direct plant tissue damage. I also agree that the highest potential for effect would be deposition of dust on the leaves and fruit which could result in reduced plant growth rates and potential degradation of fruit quality.

I consider that Beca's assessment of the potential for effects on the adjacent cropping correctly identifies that the existing environment has a high variability in background dust deposition rates. As such the existing crops will already be exposed to dust deposition from natural/existing sources. The question is whether or not the proposed future operation of the quarry will add to this existing dust loading and result in cumulative effects on the crops.

The proposed increase in product extraction rates (from 70,000 m^3/annum to 200,000 m^3/annum) and expanded quarry footprint (from 19 ha to 27 ha) is substantial. However, the current quarry has been operational for 25 years and ORC has not received any dust related complaints except for one which occurred after the application was lodged. Based on this lack of complaints it is reasonable for Beca to conclude that the existing operation is implementing dust mitigation measures which are effective and not resulting in adverse effects on neighbouring properties/crops.

Whilst there is an increased risk to adverse dust effects with increased material processing rates, based on discussions with Beca's air quality expert (Prue Harwood)[3], the applicant is not seeking to add additional aggregate processing plant on-site, but rather just run the plant for longer durations. As such there is a reduced risk of 'cumulative' effects from this source as there will not be any 'new' sources. It is also noted from these discussions that the use of 'mobile processing plant' mentioned in the AQA refers only to the existing main processing plant (as part of it is in theory mobile) which is not proposed to move from its current location. The applicant is not proposing to utilise any additional mobile processing plants at other locations on the site.

With regards to the product extraction from the 8 ha expansion area, the methodology for this extraction and the associated mitigation measures which are currently being employed on-site are proposed to remain the same (and in some instances more stringent mitigation is proposed). There are areas of the existing quarry which have similar separation distances from existing cropping areas to that which are proposed in the expansion area. In the absence of complaints or confirmed off-site effects on these adjacent crops from the existing quarry's discharges to air it is reasonable to conclude that should the current mitigation be employed in the new extraction area that adverse effects will be avoided. Notwithstanding the above, the applicant is proposing additional industry standard mitigation measures on top of that currently employed (i.e. realtime wind and dust monitoring and associated restricted work conditions).

Beca has supplied an extensive analysis of wind conditions which could result in effects on any given off-site cropping receptor in Section 3 of the s92 response. I agree with the conclusions in this assessment that any one cropping receptor will have a low percentage of time that it is downwind from winds above 5 m/s. This reduces the potential for effect on any one given receptor. In addition,

[3] Personal communications on 11/3/21 with Prue Harwood, the Beca air quality expert who has prepared the ADA and s92 response.

there are varying separation distances between the emission sources and each cropping operation. A number of these separation distances are well in excess of 250 m which would be the furthest extent at which an adverse dust effect could occur (however with industry best practice mitigation in place I consider that the potential for effects will be limited to within 100 m of the emission source).

The applicant has now proposed to extend the proposed realtime TSP monitoring and additional mitigation measures outlined in Section 7.3 of the ADA to occur whenever there are operations within 100 m of any off-site cropping operation. I consider that this is an appropriate mitigation measure and that by utilising real time dust and wind monitoring to restrict and ultimately cease discharges from within 100 m of these cropping operations that the residual risk of adverse effects on the crops will be low.

Also, based on my discussions with Ms Harwood, the applicant is proposing to undertake the additional monitoring and mitigation measures for any activity occurring within 100 m of a sensitive receptor from activities within the existing quarry. These monitoring requirements should be included in a Consent Condition should the Consent be granted.

Response to Question 3

Beca has provided a photo of the weather station located on the Fulton Hogan quarry, the data from which has formed the basis for the wind direction and speed assessments for the Amisfield Quarry expansion. Beca has calculated the increase in wind speed which would occur between 7.5 m above ground level as compared with 10 m above ground level. I agree with Beca that the adjustment factor of 1.04 will result in a negligible change in the calculated effects.

Additionally, I note from the photo that the weather station appears to be well situated in an open, unobstructed area where the wind flows are unlikely to be impeded by vegetation, topography or structures.

Therefore, I am happy that the wind data used in the assessment is representative of conditions at the Amisfield Quarry.

Response to Question 4

Whilst Beca has not addressed the likely/actual differences in the quartz content of the material which is processed at the Amisfield quarry as compared with that in the Yaldhurst monitoring program which was used to support the conclusions in the ADA, Beca is correct that the potential for RCS health effects is more dependent on the point source mitigation used and separation distances between the emission source and neighbouring receptors.

I accept Beca's assertions that the separation distance between the current product processing plant and the nearest dwelling are beyond that which current research would indicate that there is a potential for adverse health effects. As stated above, I have been informed that the product processing plant will not move from its existing location and there will not be any mobile plant operating at locations closer to off-site receptors, therefore I agree with Beca that the potential for adverse health effects from the discharge of RCS are low to negligible.

Response to Question 5

I have discussed the subject of progressive rehabilitation/stabilisation of exposed areas with Ms Harwood. I expressed my concerns that should the applicant end up having large areas of exposed unconsolidated surfaces and as such the risk for dust emissions from the site will increase. Ms

Harwood stated that the current plan is to rehabilitate quarried areas 'as needed'. I suggested that the applicant could consider including contingency mitigation measures in it's AQMP should the unconsolidated surfaces from previous extraction stages result in off-site effects/excessive dust discharges. Examples of contingency mitigation measures include, stabilisation of the surface with chemical surfactants, covering the surface with a layer of washed product such that the amount of surface fines is reduced, temporary rehabilitation, etc. Ms Harwood agreed that this would be appropriate.

Response to Question 6

From the response to this question I note that the processing plant produces products which have a higher potential for dust discharges (due to the higher proportion of fines). However, Beca has confirmed that the current plant will not move, will not increase in size and that the current mitigation measures (which have been successful to date) will be maintained. In addition, Beca has provided an analysis of the separation distances between the plant and the nearest boundaries/off-site receptors. In most instances the separation distances between sensitive receptors and the processing plant are relatively large. Additionally, I note that the applicant is proposing good practice dust mitigation measures (the use of water on the processing plant at all times)

In the s92 response Beca has provided the maximum processing rates for the existing processing plant (250 t/hr). I recommend that this is included in a Consent Condition such that the scale of the processing plant is maintained within that assessed in the AQA. If the applicant is agreeable, I recommend that the location of the processing plant also be fixed to that which has been assessed in the ADA and the s92 response.

Response to Question 7

Beca has undertaken an assessment of potential effects on the vineyard to the southwest of the Quarry throughout the s92 response and in Section 8 of the s92 response. This magnitude of dust effect on this receptor has been assessed as 'slight adverse effect' utilising the IAQM method adopted by Beca.

Summary and Conclusions

In my opinion, CCC need to undertake a high level of dust mitigation to ensure that nuisance, ecological, or health based air quality effects do not occur off-site. This is a function of the size and scale of the proposed quarry in conjunction with the small separation distances between some air discharging activities and the nearest off-site sensitive receptors.

I have undertaken a technical review of the air quality assessment of effects and subsequent s92 response provided by Beca on behalf of CCC. In my professional opinion the applicant is proposing to use dust mitigation measures which are consistent with industry good practice for a quarry operation such as that proposed.

The site is unique in the fact that it is almost entirely surrounded by cropping activities (cherry orchards and vineyards). Whilst the deposition of dust can result in adverse effects to plant health and degrade crops, this effect is dose dependant. The existing environment can have high natural dust deposition levels due to weather conditions and existing sources of dust in the environment. Based on the information I have reviewed the current operation of the quarry (which has operated for 25 years) is not resulting in adverse effects on these cropping operations. Whilst the applicant is proposing to increase both the quarry extraction rates and the area for extraction, the applicant is

also proposing to increase the level of dust mitigation on-site, particularly within 100 m of off-site sensitive receptors (including cropping operations).

In my opinion the greatest risk for adverse off-site effects is from dust emitting activities which are proposed to occur within 100 m of off-site sensitive receptors, as intensities of dust deposition will be greatest within close proximity to the sensitive receptors (due to reduced dispersion and progressive deposition of heavier particulates). The applicant has identified this as a risk and is proposing a high level of mitigation and monitoring when any activities are occurring within these critical separation distances (as outlined in Section 7.3 of the ADA). This additional mitigation includes alarm trigger points which require contributing dust sources within 200 m of sensitive receptors to cease. Neighbouring cropping activities have also been included in the definition of 'sensitive receptors' for the purposes of the requirements for this additional mitigation. I consider that this level of mitigation is appropriate and that the residual risk of adverse dust effects at both residential and cropping receptors will be low post mitigation.

I provided a list of additional mitigation measures in my initial review (NZ Air review letter dated 12/1/21), a number of these are still valid. They are not mandatory but should be considered by the applicant and added into the proposed AQMP where appropriate.

I have also recommended aspects of the application and proposed operation which could be included in Consent Conditions should ORC be of the mind to grant the consent.

Closure

If you have any questions about this review, please contact Donovan Van Kekem on 021 329 970.

Yours Sincerely,

Donovan Van Kekem

Managing Director

NZAIR