Before the Hearing Panel appointed by Canterbury Regional Council and Selwyn District Council

IN THE MATTER OF	The Resource Management Act 1991
AND	
IN THE MATTER OF	Applications CRC192408, CRC192409, CRC192410, CRC192411, CRC192412, CRC192413 and CRC192414 by Fulton Hogan Limited for a suite of resource consents to establish a quarry operation

Section 42A Officer's Report

Report of Hannah Louise Goslin

Hearing Commences: 18 November 2019

Report of Hannah Goslin

1. My name is Hannah Louise Goslin and I have been contracted by the Canterbury Regional Council (CRC) to prepare a section 42A Report for this resource consent application.

2. I am a Resource Management Consultant from Incite, which has offices in Auckland, Wellington, Dunedin and Kaiapoi. I hold a Bachelor of Science in Geography from Canterbury University. I am an Associate member of the New Zealand Planning Institute (NZPI) and a member of the Resource Management Law Association (RMLA).

3. I have 5 years' resource management experience, having previously worked at the CRC as a Consent Planner. Over this time, I have prepared and presented section 42A reports for a range of activities, including large scale land development, municipal infrastructure projects, coastal permits and discharges to land, water and air.

4. This report is prepared under the provisions of section 42A of the Resource Management Act 1991 (RMA). This section allows a council officer, consultant or any other person commissioned by the consent authority to provide a report to the decision-maker (referred to from this point on as the 'Hearing Panel') on a resource consent made to the Council, and allows the Hearing Panel to consider the report at the hearing. Section 41(4) of the RMA allows the Hearing Panel to request and receive, from any person who makes a report under section 42A *"any information or advice that is relevant and reasonably necessary to determine the application".*

5. This report will provide the Hearing Panel with information and advice related to:

    a. The background to the application;

    b. Details of the notification of the application and submissions received;

    c. An outline of the relevant legal and planning provisions;

    d. An audit of the assessment of environmental effects provided by the applicant;

    e. An assessment of Council policy relevant to the applications;

f. Recommendations in relation to the matters specified in section 104 and Part 2 of the RMA; and

g. Recommendations on the decision to be made by the Hearing Panel including comments on whether the application can be granted or should be refused; if the application is to be granted what measures are required to avoid, remedy or mitigate any adverse effects, what monitoring could be undertaken and the duration of the consent.

6. This report draws on conclusions made in technical reports provided by a number of experts, including staff employed by CRC and external consultants. Each expert has prepared a report in accordance with section 42A of the RMA. Conclusions made in each report are referenced in this report. A legal opinion on one issue arising in relation to the application has also been provided. Each report prepared by experts and the legal opinion are included as appendices and should be read in conjunction with this report:

   a. Appendix 1: Section 42A report of Ms Deborah Ryan, PDP Technical Director – Air Quality;

   b. Appendix 2: Section 42A report of Dr Lisa Scott, CRC Senior Scientist - Groundwater Quality;

   c. Appendix 3: Section 42A report of Mr Rowan Freeman, CRC Principal Science Advisor, Environmental Science and Hazards;

   d. Appendix 4: Memorandum *'Authorising additional uses of water – Fulton Hogan Limited – Roydon Quarry'* prepared by Lucy de Latour and Kate Woods of Wynn Williams;

   e. Appendix 5: Memorandum *'Yaldhurst Air Quality Monitoring Programme brief for the Fulton Hogan Quarry Hearing'* Prepared by Mr Steve Firth, CRC Regional Leader – Compliance Monitoring and Regional Support;

   f. Appendix 6: Memorandum *'Annual Volume for Resource Consent CRC182422 and CRC192414'* of Mr David Just, CRC Team Leader Consents Planning; and

   g. Appendix 7: Recommended Condition Table.

7. Any further changes to the proposal and mitigation may affect the conclusions of the reports or memorandums listed above. This report will highlight gaps in the information supporting the application and will make recommendations as to how these gaps may be addressed by Fulton Hogan. Where feasible, I will comment on the implications of any changes made during the course of the hearing. Where this is not feasible, or changes are made following the circulation of this report, a separate addendum report may be required.

8. It should be emphasised that any conclusions reached, or recommendations made in this report are not binding on the Hearing Panel. It should not be assumed that the Hearing Panel will reach the same conclusion or decision having considered all the evidence to be brought before it by the applicant and submitters.

9. This report only assesses the Regional Council aspects of the application. A separate report assessing District Council matters has been prepared by Mr Andrew Henderson on behalf of the Selwyn District Council (SDC).

10. As indicated throughout the body of this report, I have appended a set of recommended conditions for each resource consent sought to assist the Hearing Panel. At this stage, the recommended conditions are the most recent iteration of draft conditions provided by the applicant in a table with my comments for recommended changes or additions. It is anticipated that the conditions will be further refined through conferencing and caucusing between the date this report is circulated and the start date of the hearing. The recommended conditions appended to this report are intended to be a starting point for such discussions. A final recommended set can be provided on request.

EXECUTIVE SUMMARY

11. Fulton Hogan Limited have applied for a suite of resource consents from the Canterbury Regional Council (CRC) to establish a new aggregate quarry and cleanfilling operation at the site located at 107 Dawsons road and 220 Jones Road, Templeton.

12. The key adverse effects identified from the proposal include:

Air Quality

13. At the time of drafting this report, the applicant has not demonstrated the discharge would not be likely at any time, to increase the concentration of PM_{10} in the polluted airshed by more than 2.5 μ/m^3. Therefore, at this time I do not consider the applicant is able to comply with Regulation 17(1) of the National Environmental Standards for Air Quality (NESAQ).

14. The applicant has not provided information such that I am satisfied they can reliably reduce PM_{10} discharged from another source, nor has the applicant proposed a condition which requires the reductions to take effect 12 months following the grant of a resource consent (if it is able to be granted). Therefore, an offset that meets the requirements of Regulation 17(3) has not been proposed. My recommendation, at this stage, is that Regulation 17(1) of the NESAQ requires the application to be declined.

15. There is the ability for the applicant to provide additional information through its evidence, expert conferencing, caucusing or at the Hearing on whether Regulation 17(1) can be complied with or an offset can be achieved in accordance with Regulation 17(3). If the Hearing Panel are satisfied Regulation 17(1) or 17(3) of the NESAQ is able to be complied with, I have provided an assessment of the effects of dust discharges and an assessment of the relevant objectives and policies of the Canterbury Regional Policy Statement and the CARP in this report. I have assessed that the proposal is inconsistent with and contrary to some of the relevant objectives and policies in the CARP related to ambient air quality.

Groundwater Quantity

16. A new water permit is sought to use water taken under an existing permit (CRC182422) for dust suppression and ancillary activities. The applicant is not proposing any increase in the rate or volume of water taken, so long as the annual volume imposed on the consent conditions (if granted) accurately reflects this, there should be no effects on water quantity beyond those already consented.

Groundwater Quality

17. In terms of excavation, subject to careful compliance with maximum excavation depths, implementation of measures to reduce the likelihood of spills and leaks and prompt attendance to spills or leaks if they were to occur, I consider the actual and potential adverse effects are able to be adequately mitigated.

18. Cleanfilling of the site and future site use present the highest risk to groundwater quality overall. In terms of cleanfilling, even with compliance with strict cleanfill management, there may be some degradation to the aesthetic qualities (e.g: hardness, taste, colour) of existing high quality groundwater below the deposition site. However, it is expected that such effects would be localised, low-impact and dissipate within a few hundred metres of the proposed quarry site.

19. Post cleanfilling and rehabilitation at the site, I consider there is potential for future land use activities which could result in unacceptable risk to groundwater long term. I recommend a covenant should be listed on each land title associated with the site

to exclude high intensity land uses that may cause effects on groundwater quality in future.

I recommend, pursuant to sections 104, 104B, 105, 107 and 108 and subject to Part 2 of the Resource Management Act 1991, to **REFUSE** the applications by Fulton Hogan Limited for resource consents to establish and undertake a gravel quarry and cleanfill operation at 107 Dawsons Road and 220 Jones Road, Templeton.

If compliance with Regulation 17(1) of the NESAQ is able to be achieved, or an offset is proposed in accordance with Regulation 17(3), I will reconsider my recommendation. I anticipate that this could be reasonably expected to occur following caucusing or conferencing on the matter and would be filed as a supplementary section 42A report.

CONTENTS

INTRODUCTION

20. Fulton Hogan Limited (the applicant) have applied for a suite of resource consents to establish a new aggregate quarry (known as 'Roydon Quarry') within the site bounded by Curraghs Road, Dawsons Road, Maddisons Road and Jones Road (the site). The physical address of the site is 107 Dawsons Road and 220 Jones Road, Templeton. The site is legally described as:

Legal Description	**Area in ha**
Rural Section 6475 and Rural Section 6324	28.3279
Lot 1 DP 4031	80.9953
Rural Section 6342	8.0937
Section 7 Survey Office Plan 510345	16.4993
Rural Section 5381 and Section 6 Survey Office Plan 510345	36.4188
Total ha of site overall	**170.335**[1]

21. To authorise the proposed quarry operation and ancillary activities, the following resource consents have been applied for:

CRC Number	**Consent Type**	**Description**
CRC192408	Land Use (RMA section 9)	Use of land to excavate material
CRC192409	Land Use (RMA section 9)	Use of land to deposit cleanfill over an unconfined/semi-confined aquifer
CRC192410	Discharge Permit (RMA section 15)	To discharge contaminants into air from an industrial or trade premise or process
CRC192411	Discharge Permit (RMA section 15)	To discharge contaminants into land which may enter groundwater from an industrial or trade process within the Selwyn- Te Waihora sub-region
CRC192412	Discharge Permit (RMA section 15)	To discharge stormwater into land where contaminants may enter groundwater
CRC192413	Discharge Permit (RMA	To discharge contaminants into land where contaminants may enter groundwater associated with the

[1] The applicant has referred to there total site area as 171ha and 170ha.

	section 15)	deposition of cleanfill for site rehabiliatation
CRC192414	Water Permit (RMA section 14) Or Change of Conditions (RMA section 127)	To take water for aggregate washing and dust suppression Or To change the conditions of existing water permit CRC182422 to allow the take of water for aggregate washing and dust supression

22. To provide for the taking of water for quarrying purposes, the applicant originally applied to change the conditions of an existing water permit (CRC182422) in accordance with section 127 of the RMA. Resource consent CRC183422 authorises the take and use of groundwater for the irrigation of 32 hectares at the proposed quarry site. It is my view that the proposed changes to the conditions are outside of the scope of the existing consent. In coming to this view, I have relied on the advice summarised in the Memorandum prepared by Wynn Williams and appended to this report as Appendix 4. As I understand it, where the proposed changes result in:

    a. a fundamentally different activity; or

    b. the activity having materially different adverse effects; or

    c. the activity being expanded or extended beyond the original activity;

    the application must be treated as a 'new application'. I consider the 'use' of water for the purpose of dust suppression, aggregate washing and other ancillary quarrying activities is a fundamentally different activity than that applied for under CRC010516.[2] The memorandum prepared by Wynn Williams concludes the following:

    "If granted, the new "use" permit will be able to sit alongside CRC182422 and authorise the additional uses. There is nothing in the RMA that restricts two resource consents from sitting alongside one another and being exercised concurrently, provided that exercising one consent does not cause a breach of conditions of the other consent. In this case, we would expect that the new "use" permit would need to clarify that the permit only authorises the additional uses under CRC182422 and does not amend the rate or volume of the abstraction, at any one time, under CRC182422."

23. I agree with the conclusions made in the Wynn Williams Memorandum and consider the application should be treated as a 'new application' to use water for aggregate washing and dust suppression purposes. It is highlighted in the Wynn Williams Memorandum that CRC are currently involved in a High Court case (*Aotearoa Water Action Incorporated v Canterbury Regional Council)* that will consider the issue of whether a new separate use permit can be granted to enable water taken under an existing water permit to be used for a different purpose.

24. The site is within the Selwyn District and the applicant has applied to the SDC for the necessary land use consents required under the Selwyn District Plan and Resource Management (National Environmental Standards for Assessing and

[2] Transfered to the applicant as CRC182422.

Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).

25. If resource consents are granted, the applicant seeks to commence quarry operations in 2020.

BACKGROUND

26. The applicant currently operates three quarries within the Greater Christchurch area where the extraction and processing of aggregate is undertaken. These include Miners Road (Yaldhurst Quarry) and Pound Road (Islington and McLeans Island Quarries). The applicant also operates a number of extraction-only sites[3], including Barters Road Quarry (Templeton) and Roberts Road Quarry (Islington).

27. The applicant highlights that the aggregate resource at their Pound Road Quarry is nearing exhaustion at a rate quicker than anticipated due to the high demand for aggregate resulting from the Christchurch rebuild. It has been predicted by the applicant, that the demand for aggregate in future on a 'business as usual' basis is significant. To provide a 'low cost' aggregate resource, in close proximity to Christchurch City and Greater Christchurch, the Roydon Quarry site was identified by the applicant as being the most appropriate location.

NOTIFICATION

28. The applicant requested that the application be publicly notified. In accordance with section 95A(3)(a) of the RMA, the application was publicly notified as part of a joint process with SDC on 6 April 2019. The application was notified on the CRC webpage and in the following publications:

    a. The Press;

    b. The Selwyn Times; and

    c. The Western News.

29. The notification wording was as follows:

Applicant: Fulton Hogan Limited **Address for service: c/- Golder Associates PO Box 2281 Christchurch 8041** **Attention: Kevin Bligh/ Geoff England**
The Canterbury Regional Council and Selwyn District Council have received an application from Fulton Hogan Limited for various resource consents to establish an aggregate quarry (known as 'Roydon Quarry') at the site within the Selwyn District bounded by Curraghs Road, Dawsons Road, Madisons Road and Jones Road, Canterbury, legally identified as: Rural Section 6475 and Rural Section 6324; Lot 1 Deposited Plan 4031; Rural Section 6342; Section 7 Survey Office Plan 510345, and Rural Section 5381 and Section 6 Survey Office Plan 510345 The proposed quarry will generally involve topsoil stripping, bund formation, aggregate extraction to a depth of approximately ten metres below ground level and rehabilitation of the site with cleanfill, overburden and topsoil material. From extraction areas, aggregate material will be transferred by field conveyers and dump trucks to on-site processing plant, which will involve crushing, screening and washing of aggregates. The use of a mobile processing plant is also proposed.

[3] No procesing, cleaning or sorting facilities located at 'extraction-only sites'.

Other activities that are proposed to occur on site include stockpiling of aggregates, wash water ponds, workshops, staff amenity blocks and offices, along with the management of adverse effects such as bunding and screen planting, as well as dust mitigation. Dedicated accesses for heavy and light vehicles will be created off Jones Road, and improvements to Jones Road are proposed, including two options for a roundabout near the intersection of Jones and Dawsons Roads.

Fulton Hogan Ltd have also applied to use water taken pursuant to existing resource consent CRC182422, for the purposes of aggregate washing and dust suppression. Fulton Hogan Ltd have sought a change to the conditions of resource consent CRC182442 to enable this additional use (and a change to Condition 5c). However, it may, in fact, require a new "use" permit to sit alongside CRC182442. Accordingly, a new use permit has been applied for as an alternative to the application under section 127 of the RMA to change the conditions of CRC182442. Either way, the status of the activity (being a different use of water) is discretionary regardless of whether the outcome is achieved by way of a change of conditions or a new resource consent for the use of water.

The applicant has applied for the following resource consents from:

Canterbury Regional Council

CRC192408 – A land use consent to excavate material.

CRC192409 – A land use consent to deposit cleanfill over an unconfined/semi-confined aquifer.

CRC192410 – A discharge permit to discharge contaminants into air from an industrial or trade premise or process.

CRC192411 – A discharge permit to discharge contaminants into land where it may enter water from an industrial or trade process within the Selwyn-Te Waihora sub-region.

CRC192412 – A discharge permit to discharge stormwater into land where contaminants may enter groundwater.

CRC192413 – A discharge permit to discharge contaminants into land where contaminants may enter groundwater associated with the deposition of cleanfill for site rehabilitation.

CRC192414 – A water permit to use water for aggregate washing and dust suppression, either as a change to the conditions of resource consent CRC182422 or a new water permit to use water.

Selwyn District Council

RC185627 - A land use consent for gravel extraction and processing operations within the Inner Plains zone.

An unlimited consent duration is sought for all land use consents, and a consent duration of 35 years is sought for the discharge permits. The proposed expiry date for the water permit is 1 July 2032, which is the same expiry date as the existing water permit (CRC182422).

30. Following lodgement of the application with CRC the following potentially interested parties were informed of the application:

a. Te Ngāi Tūāhuriri Rūnanga;

b. Department of Conservation; and

c. Canterbury District Health Board (CDHB).

31. CRC served notice on all land owners and occupiers within 250 metres of the entire site boundary, in addition to those within, 1 kilometre down-gradient and 200 metres upgradient (in terms of groundwater flow) of the site boundary. The reasons for adopting this distance are discussed in the memorandum *'Notification Recommendation and Decision for CRC192408, CRC12409, CRC192410, CRC192411, CRC192412, CRC192413 and CRC192414'.* The reasons can be summarised as:

    a. In accordance with advice from Ms Ryan, a distance of 250 metres is based on recommended setback distances to quarry operations (including quarrying, crushing, screening, stockpiling and conveying of rock) without blasting[4]; and

    b. In accordance with advice from Dr Scott, landowners and occupiers within one kilometre down-gradient (in terms of groundwater flow direction) and 200 metres upgradient of the applicant's site may experience effects that are minor or more than minor on groundwater quality.

32. In addition to the public notification undertaken, 327 parties were directly served notice of the application.

Submissions

33. The submission period was doubled at the discretion of the CRC[5] due to the scale and complexity of information to be reviewed by submitters. The submission period closed on 6 June 2019.

34. In total 454 submissions were received. A brief summary of these submissions is outlined below:

    a. 354 oppose the application;

    b. 92 support the application;

    c. 8 indicate they are neutral to the application;

    d. 178 indicated in their submission that they wish to be heard; and

    e. 276 indicated in their submission that they do not wish to be heard.

35. Given the high number of submissions, it is not practical to outline every submission issue in detail in this report. In this report, I have only summarised matters raised that are consistent with the functions of Regional Councils under the RMA.[6]

36. Matters arising from submissions can be summarised as follows:

    a. Dust and the effects of dust on the following:

        i. Community health (particularly young, old and those with compromised immunity or existing respiratory illnesses);

        ii. Residential dwellings, gardens and vehicles;

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[4] Victoria Environmental Protection Authority (VPA) Recommended Separation distances for industrial residual air emissions – Guideline (Pg. 9), Publication Number: 1518, Release Date: 7 March 2013.

[5] In accordance with section 37A(4)(b)(i) of the RMA.

[6] In accordance with section 30 of the RMA.

iii. Local industry and commercial operations (including orchards, market gardens, plant nurseries, livestock, accommodation facilities and racehorse breeding and training operations);

iv. Care/respite care and educational facilities (Templeton Primary School, Templeton Kindergarten, Brackenridge Services Limited);

v. Places of worship (Samadhi Buddhist Virhara);

vi. Water quality (including water races and rainwater collection tanks);

vii. Operations of Christchurch International Airport (specifically effects on aviation safety during take-off and landing); and

viii. Nuisance effects resulting in a decrease in amenity for other community facilities (including accommodation providers).

b. Effects of other contaminants discharged into air (arising from the operation of vehicles, trucks and machinery).

c. Submissions concerned with effects on air quality arising from dust and other contaminants raised issues with mitigation measures and sought the following additional mitigation measures:

i. Additional measures to mitigate dust including;

1. Increased setback distances (from property boundaries and machinery);

2. Increased air quality monitoring at all quarry boundaries and certification of equipment;

3. Spray or mist systems installed around the site perimeter and operated at all times (not just when quarrying);

4. Limiting open quarried area to 4 hectares;

5. All truck loads to be covered;

6. All operations to cease if dust goes beyond the property boundary;

7. Sufficient planting to mitigate dust;

8. Requiring dust monitoring to be undertaken on neighbouring properties; and

9. Wheel wash for trucks.

d. Water quality and the effects of excavation, deposition and discharges on the following:

i. The quality of domestic and stock drinking water (specifically effects on Community Supply Well M36/7575 owned by SDC and down-gradient wells) particularly arising from hydrocarbon spills, stormwater discharges and ponds;

ii. The effects of silica in groundwater; and

iii. Proposed ponds (for aggregate washwater and dust suppression) increasing bird life in the area and the effects this may have on the operation of Christchurch International Airport (increased risk of bird strike).

e. Water quantity and the effects on water levels in a groundwater zone that is considered overallocated.

f. Submissions concerned with effects on groundwater quality arising from excavation, deposition or discharges sought the following additional mitigation measures:

    i. Accidental discovery protocol to address accidental discovery of Kōiwi Tanagata and Taonga tuku iho (Ngāi Tahu Cultural Artifacts);

    ii. Re-assessment of excavation depths if groundwater levels rise due to Central Plains Water Scheme; and

    iii. Strict controls on cleanfill material and a clear paper trail of all cleanfill deposited.

g. Submissions requesting other mitigation included:

    i. No more “water rights” to be granted;

    ii. Netting over ponds to discourage mosquitos;

    iii. Independent audits to establish consent compliance, including the use of aerial photography to establish compliance;

    iv. Requiring all collected monitoring data and reports to be publicly available online and in real-time;

    v. Collection of bonds (individual submissions suggest variable amounts); and

    vi. If consent is granted, there are no variations or changes to conditions. If variations or changes are applied for, they are publicly notified.

h. Other matters raised in submissions include:

    i. Impact of the recent Harewood Gravels Environment Court and High Court Appeals on the applicant’s proposal;

    ii. Effects on property values and ability to sell property;

    iii. Rehabilitation of the quarry and appropriate land uses post closure; and

    iv. CRC’s ability to monitor compliance and enforce consent conditions if necessary.

i. Positive matters arising from submissions included:

    i. Employment opportunities arising from the proposal;

    ii. Continued aggregate supply in close proximity to Christchurch and Greater Christchurch, reducing aggregate costs; and

    iii. The application represents best practice in the industry.

37. I have grouped submissions according to themes in the body of this report and have provided responses to those themes throughout. To assist the Hearing Panel, I have identified some specific submissions in the body of this report, however I have identified where more submitters than those listed have submitted on a particular matter.

CONSULTATION

38. Section 7 of the application sets out the consultation that has been undertaken by the applicant during the preparation of the resource consent applications. The applicant notes that a consultation plan for the proposal was formulated in accordance with International Association for Public Participation Guidelines and

Methods for Public Participation. A summary of the key aspects of the consultation is set out below:

a. Establishment of a quarry project website with frequently asked questions (FAQ) and information regarding the proposal;
b. Newsletter drops;
c. Formation of Community Advisory Group (CAG) which met regularly;
d. A family open day at the applicant's existing Miners Road Quarry;
e. A community drop in centre at the site;
f. Meetings with local resident associations;
g. Meetings with Councils, Iwi Groups, Road and Rail Controlling Authorities; and
h. Technical Expert presentations and question and answer sessions for the community.

39. Section 7.2 of the application sets out the key matters identified during the consultation process and provides the actions proposed by the applicant to mitigate the identified concerns. Of relevance to the applications for resource consents under the Regional Planning Framework, the applicant identified air quality, groundwater and site rehabilitation as key consultation themes.

DESCRIPTION OF THE PROPOSED ACTIVITY

40. The applicant proposes to establish an aggregate quarry at the site bounded by Curraghs Road, Dawsons Road, Maddisons Road and Jones Road. Section 4 (Page 14) describes the proposed activity.

41. I wish to highlight to the Hearing Panel that while on site visits with Reporting Officers and experts, the applicant described additional mitigation measures which did not form part of the application. I consider this additional mitigation does not form part of the resource consent applications made at this stage. This section sets out the proposed activity on the basis of the information regarding the proposal in the application and includes amendments provided in the two responses to requests for further information.[7] Given the application has been amended several times since lodgement, and could undergo further amendments prior to the hearing, I have described the proposed activity in detail, as I understand it at the time of writing this report. Where experts have relied on mitigation or aspects of the proposal that were discussed on site visits and that information did not form part of the application, this has been acknowledged. The applicant may wish to amend their proposal to formally include these aspects.

Overview

42. The site is approximately 170 hectares in total area. The applicant proposes to extract aggregate from the entire site, except for within the boundary setbacks. It is estimated between 12 to 15 million bank cubic metres of aggregate will be extracted from the site over the lifetime of the quarry which is anticipated by the applicant to be in excess of 30 to 40 years.

Site preparation

43. Prior to operations commencing at the site, topsoil and overburden material will be removed from the 'initial extraction area' located in the centre of the site. The fixed

[7] Dated 12 March 2019 and 16 August 2019.

plant is proposed to be located within the initial extraction area for the lifetime of the quarry operation (referred to as the central processing area from this point). This area is set back more than 500 metres from site boundaries.

44. The initial removal of overburden is proposed to take place using an excavator and dump or road trucks in combination with a loader. Overburden will be used to progressively develop bunds around the entire site perimeter, prior to excavation taking place. The applicant anticipates additional topsoil will need to be brought on site to supplement bund construction. Bunds will be vegetated and existing shelterbelts will be maintained and enhanced where required.

45. It is anticipated a 20 metre setback between the applicant's site boundary and the edge of the quarry pit will be provided and bunding will be located within the 20 metre setback.

46. The applicant proposes to establish both fixed and mobile plant at the site as follows:

    a. *Fixed plant:*

       Will be located in the central processing area, at least 500 metres from all site boundaries. Fixed plant will provide for crushing, screening, conveyance and stockpiling of excavated aggregate and processed materials.

    b. *Mobile Plant:*

       Will be located at least 250 metres from site boundaries and may be used in combination with fixed processing plant as required to produce specific products.

       Both fixed and mobile plant will extend above the quarry pit floor, but no higher than the top of the bunds (approximately 3 metres above natural ground level[8]).

47. The applicant proposes to establish processing and stockpiling areas, prior to establishing other site facilities including the workshop and offices.

Extraction, processing and stockpiling of aggregate

48. The applicant proposes to undertake extraction activities in several stages with an 'open area' of no more than 26 hectares at any one time. Open area limits for active quarrying are proposed to be comprised as follows:

Purpose	**Area (Ha)**
Central processing area, its fixed plant, stockpiles, mobile plant etc	7
Excavation in process	5
Fill and rehabilitation in process	5
Site roads – unsealed	5
Field conveyer, service lanes	4
Total active area (Max.)	**26**

Table 1: Open area limits for active quarrying

49. The active working quarry area excludes:

    a. Site offices, amenity blocks, workshop and surrounding areas;

    b. Areas where refuelling takes place;

[8] Natural ground level is considered to be the level of the site pre quarry extraction taking place.

c. Storage areas for quarry plant and machinery; and

d. Any paved, bunded or planted areas.

50. Following the establishment of the central processing area in the middle of the site, Stage 1 extraction is proposed to commence in a southerly direction, before moving to the north, then west before returning south and east in an anti-clockwise direction. Further details related to proposed staging is set out in the second response to further information.

51. The applicant states that due to the size and composition of alluvial materials, blasting is not required to extract aggregate and will not be undertaken.

52. Once aggregate is extracted it will be transported (mostly via field conveyers although transportation via trucks is also proposed) to the central processing area. Based on demand, material may also be processed by mobile plant. Processed aggregate will then be stockpiled and sold via the weighbridge. Material will be transported via truck to the central processing area in the following circumstances:

a. In the event of a conveyer breakdown; and

b. When conveyers are required to be reconfigured.

53. The applicant confirmed in the first further information response that the processing of aggregate will predominantly be material extracted from the site but from time to time there may be aggregate sourced from elsewhere brought onto the site for processing.

54. The applicant proposes to eventually excavate aggregate across the site to a maximum depth of 9.9 metres below natural ground level. However, a depth between 8.1 and 9.9 metres below ground level is initially proposed for the first 5 years of quarrying to confirm a maximum depth of 9.9 metres can be achieved while maintaining a separation of one metre to groundwater at all times. If the quarry floor is excavated to a maximum depth of 9.9 metres in the northwest of the site and 8.1 metres in the southeast, the quarry floor will achieve a slope from approximately 42.5 metres above mean sea level in the northwest corner of the site to 32.5 metres above mean sea level in the southeast corner. The applicant provided a map series depicting indicative quarry floor surface and groundwater levels in their first further information response.

55. To maintain the quarry floor level, the applicant proposes to survey the site prior to excavation and then annually to determine elevations of the site relative to mean sea level. The applicant has proposed a condition to this effect.

56. In the event groundwater was to rise within 1 metre of the quarry floor, the applicant proposes to deposit virgin materials sourced from the site to restore the required 1 metre separation.

57. Stockpiles of processed aggregate are proposed to be located on the quarry pit floor and have a maximum total volume of 200,000 m^3. All stockpiles associated with the fixed plant will be setback at least 400 metres from site boundaries, while smaller stockpiles associated with mobile plant may be located up to 250 metres from the site boundary.

58. Immediately following the discovery or evidence of any material suspected to be a taonga, koiwi or archaeological site, the applicant proposes to undertake an accidental discovery protocol.

Deposition of cleanfill and site rehabilitation

59. The deposition of cleanfill is proposed to occur progressively as manageable areas become available within the maximum areas specified in Table 1 above. Cleanfill

material deposited at the site will meet the definition in the Canterbury Land and Water Regional Plan (CLWRP) and will be undertaken in accordance with a Cleanfill Management Plan for the site.

60. The cleanfilling procedure proposed is set in the draft conditions provided with the second response to further information.

61. The applicant proposes to maintain a declaration record of all material accepted at the site.

62. The applicant does not propose to deposit cleanfill to fill the excavated quarry pit to original ground level at the site. The following minimum requirements are proposed by the applicant with respect to rehabilitation:

    a. Topsoil and stored overburden materials will be re-spread and contoured to a depth of 300 millimetres. This results in a minimum finished floor level of 1.3 metres above highest groundwater level; and

    b. Stabilisation of battered slopes and grassing or planting of other vegetation is completed. Restored extraction areas shall be free draining and consist of a stable landform.

63. The applicant proposes to complete rehabilitation of each "worked out stage" within six months of the conclusion of cleanfilling.

64. The applicant proposes to monitor groundwater levels and quality via two down-gradient and two up-gradient existing bores on the site.[9] The proposed sampling regime is set out in the draft conditions provided with the second response to further information.

65. The applicant notes that the site may be used to process aggregates once the resource from the site is exhausted.

66. The applicant states that they intend for the site to be an exemplar of site rehabilitation. It is proposed that the site will be restored to a form where it can be used for a variety of activities. These may include farming, animal boarding recreation and other activities consistent with a Rural Zone. A draft Rehabilitation Management Plan is included with the application as Appendix G.

67. The first response to further information highlights the applicant's willingness to discuss a bond for rehabilitation.

Discharge of contaminants into air

68. The applicant considers the main contaminant of concern resulting from the proposed quarry will be the discharge of dust into air. The applicant also acknowledges the discharge of combustible gas into air is likely to result from the operation of machinery at the site.

69. The applicant proposes to undertake all dust mitigation measures and monitoring in accordance with a Dust Management Plan (DMP) for the site.[10]

70. The following site-wide measures are proposed to mitigate and manage dust:

    a. All extraction works will be setback at least 20 metres from site boundaries;

    b. Existing shelterbelts will be retained and enhanced where there are gaps or the vegetation is in poor condition. Vegetated bunds will be located within the 20 metre setback to site boundaries as described above. Bunds are proposed

[9] BX23/0836; BX23/0833; BX23/0834 and BX23/0835.
[10] A draft DMP is appended to the original application as Appendix D.

to extend approximately 3 metres in height above natural ground level and extend around the perimeter of the entire site (except for the site access).

c. Maintaining separation distances between dust generating activities and site boundaries as follows:

    i. Fixed processing plant is proposed to be set back at least 500 metres from site boundaries; and

    ii. Mobile processing plan is proposed to be set back at least 250 metres from site boundaries.

d. Minimising exposed areas which can be a source of dust during periods of strong, dry winds to 26 hectares at any given time. Where exposed areas will not be disturbed for a period set out in the DMP a surface treatment (chemical dust suppressant) is proposed to be applied.

e. Water carts are proposed to be used as required throughout the site for dust suppression. The applicant anticipates that this would need to occur during dry weather, irrespective of windspeed. Water will be sourced from the applicant's onsite bore (M36/0257);

f. Installation of a metrological monitoring station at a representative location at the site.

71. The applicant proposes the following measures to minimise dust specific to particular areas and activities:

Site preparation and rehabilitation

a. Avoid undertaking land stripping and bund formation works at the site when weather conditions are forecast for strong winds or particularly dry periods;

b. Areas of land to be stripped will be pre-dampened during dry periods;

c. Water will be applied as required to ensure areas of exposed earth on bunds or stockpiles is dampened or a 'crust' has formed. Once bunds have been formed, re-grassing/hydro-seeding is proposed to occur as soon as practicable. The applicant also proposes to utilise chemical dust suppressants should bund formation occur during very dry weather. It is highlighted by the applicant that this would be an 'exceptional circumstance'.

Haul roads and site access points

d. Haul roads will be formed of a coarse aggregate base with limited fine material.

e. Limit the use of haul roads at the site and use field conveyers where possible to transport aggregate. Transportation of material via truck is proposed to occur on occasion for aggregate transport from the working face and to transport cleanfill material onto the site and to the tip head.

f. Where haul roads are used, vehicle speed limits are proposed to be limited to 15 kilometres per hour maximum.

g. To prevent potentially dusty material tracking onto public roads the applicant proposes to construct a rumble strip in addition to a sealed accessway with a minimum sealed length of 100 metres. Vacuum sweeping of the accessway is proposed to maintain an area free of dust producing material.

h. To prevent the discharge of dust from aggregate loads leaving the site, the applicant proposes to ensure loads are covered or sprayed with water.

Excavation/loading and stockpiling of aggregate

i. Loader and excavators will minimise drop heights when loading haul trucks or conveyer hoppers and moving material.

j. The applicant considers that working faces are typically damp due to the inherent moisture content of the aggregate. Where the working face has dried significantly, water or other dust suppression methods may be used.

Fixed plant area

k. It is understood from the application that the processing plant includes fixed water suppression measures. In addition, the applicant also proposes to operate a high-pressure water-misting/fog cannon system within the north-eastern and south-western corners of the fixed plant/stockpile area in the centre of the site. Both water suppression measures will be operated at all times during fixed plant operation. Similar mitigation is currently used at the applicant's existing quarry operation in Miners Road.

Use of mobile plant

l. The use of any mobile plant is proposed to take place with the use of water dust suppression (either sprays or high pressure fogging system attached to the mobile plant).

Cleanfilling and site rehabilitation

m. Any dusty fill material will be covered with large fill or rounds if necessary. Additionally, water suppression is also proposed to control any significant dust emissions.

Site wide monitoring

n. The applicant proposes to monitor weather forecasts for strong winds and rainfall events so appropriate dust management responses can be planned.

o. Operational areas (such as haul roads) are proposed to be monitored by quarry staff to verify dampness and ongoing needs for water carts and other dust control measures.

p. The applicant proposes to install a permanent real-time PM_{10} monitor at the eastern site boundary directly downwind of the active quarry area for southwest wind conditions. A real-time Total Suspended Particulate (TSP) monitor is proposed to operate on the site boundary and is proposed to be located between the active quarry/cleanfill area and off-site sensitive locations less than 500 metres from the active quarry/cleanfilling area.

q. It is proposed all dust monitors are:

    i. Fitted with an automated alarm system that, when PM_{10} concentrations exceed a specific trigger level, sends an alert to the onsite Manager or other nominated person who is available to take immediate action necessary to reduce dust emissions;

    ii. Able to record each trigger alarm event digitally to a website portal along with the findings of the investigation and any mitigation responses undertaken; and

    iii. Maintained and operated in good working order to ensure accurate data to be taken.

r. The applicant has proposed two differing sets of trigger values. The first set of trigger values and associated actions if trigger values are reached were proposed in the initial application as follows:

i. 60 µ/m³ of PM_{10} as a 1-hour average for taking immediate actions to investigate and reduce site dust emissions; and

ii. 70 µ/m³ of PM_{10} as a 1-hour average for ceasing all quarry activities (other than dust suppression activities) and taking immediate actions to investigate and reduce site dust emissions.

s. The second set of trigger values and associated actions in the event trigger values were exceeded, were proposed in the second response to further information as follows:

i. Ten-minute rolling PM_{10} concentration of 150 µ/m^3 as a 1-hour average; and

ii. Ten-minute rolling TSP concentration of 200 µ/m^3 as a 1-hour average; and

iii. One-hour rolling TSP concentration of 60 µ/m^3 as a 24-hour average.

t. For both sets of trigger values, if the triggers values listed above are reached, or exceeded the applicant proposes to implement additional dust control measures. If dust generating activities are being undertaken within 250 metres of sensitive activities and the trigger values are reached or exceeded at the boundary location directly upwind of sensitive receptors, all dust generating activities (except for dust suppression activities) are to cease.

u. Dust generating activities are also to cease when the wind direction (10-minute average) places active quarry/cleanfilling areas directly upwind of sensitive locations, the wind speed exceeds 7m/s and following a period of 12 hours or more of there being no rain at the quarry site.

v. The applicant proposes to maintain a record of all trigger breach events. The record is proposed to include:

i. The duration of the event;

ii. Summary of the windspeeds recorded (maximum and average); and

iii. Any responses to events, and whether any dust effects occurred beyond the site boundary.

Complaints register

72. The applicant proposes to maintain a complaint register at the site. The register shall be used to record complaints made from external stakeholders, including the general public, neighbours, clients and regulators.

73. Any complaints are proposed to be investigated and reported in accordance with the applicant's internal complaint management procedures.

Community Liaison Group (CLG)

74. As part of the first response to further information the applicant proposes to establish a CLG. At the time of writing this section 42A Report, the applicant proposes quarterly meetings with representatives of the following:

a. Templeton Residents Association (TRA);

b. Weedons Residents Association (WRA);

c. SDC; and

d. CRC.

Take of Water for Dust Suppression

75. The applicant proposes to utilise water allocated under an existing water permit for the site.[11] The existing consent authorises the taking of groundwater from bore M36/0257, installed to a depth of 63.4 metres below ground level at a rate of 9.5L/s, with a volume not exceeding 6,772m³ in any period of nine consecutive days. The existing permit limits the use of water for irrigation of only a portion of the site. The original resource consent application only sought water to irrigate 32 hectares of the 64 hectare property. This is not specified in the consent conditions but is reflective of the rate and volume authorised.

76. The existing water permit does not have an annual volume limit and the applicant was requested to calculate an annual volume in accordance with Policy 4.63 and Schedule 10 of the CLWRP. The applicant considers the appropriate annual volume limit for the take is 351,622m³, calculated in accordance with Schedule 10 of the CLWRP

77. The applicant also proposes to intercept and capture water from water races managed by SDC as part of the Paparoa Scheme that currently terminate within the site via soakage to land. The applicant considers the take and use of water from this source is in accordance with the conditions of CRC consent held for the Paparoa Scheme[12] and SDC Bylaw. The applicant has discussed the take and use of water from this scheme with SDC and an application must be made to SDC for a Commercial Irrigation Permit for between 3 and 5 L/s. It is my understanding the applicant has had correspondence with SDC on this matter.

Discharge of Aggregate Washwater

78. The original application included the discharge of aggregate wash water at the site. In the second further information response the applicant has removed this activity from the proposal, and I have not assessed this aspect any further.

Discharge of Truck Wash water

79. The applicant proposes to locate a truck wash facility in close proximity to the workshop at the site. The applicant notes truck washing would typically include the washing of truck trays and bodies using a high-pressure hose and biodegradable degreasers. It is expected that contaminants such as hydrocarbons and sediment are likely to be present in truck wash water.

80. The truck wash facility will be roofed and consist of a bunded concrete pad. Washdown water will be collected in a sump and discharged to an oil water separator prior to detainment in an appropriately sized holding tank. The applicant proposes to manage the truck wash water as trade waste and truck it offsite to an appropriate disposal facility. The applicant notes that where appropriate, clean stormwater will be separated and diverted to infiltration ponds on site for reuse as dust suppression or aggregate wash water.

81. Sediment collected in the sump will be periodically excavated and disposed off-site to landfill.

Discharge of Stormwater

82. Stormwater will be generated from impervious surfaces at the site such as rooves of the office, loader sheds, workshops, staff amenity blocks, sealed roads and carparking. While the applicant proposes to reuse water as far as practicable, stormwater from these surfaces will be discharged via infiltration to land.

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[11] CRC182422, Granted 6 November 2017, Expires 1 July 2032
[12] CRC012006

83. The applicant provided a description of the nature and sources of stormwater in the first response to further information.

84. The applicant notes that where stormwater volumes exceed the natural infiltration capacity of the site, water will drain to the lowest point of the site and infiltrate through gravels.

85. In the event of heavy or prolonged rainfall, the applicant considers there may be some ponding observed, but will not exceed 48-hours. The applicant proposes to design detainment areas (such as detention tanks or swales) if required. The applicant highlights that any detainment structure would either need to comply with the relevant permitted activity rules of the CLWRP or a resource consent would be sought.

Storage of Hazardous Substances

86. The applicant proposes to store fuel and lubricants (engine oil) on site to service the quarry plant and machinery. A maximum volume of 15,000 litres of diesel is proposed to be stored in a double skinned tank. Other substances are proposed to be stored within the workshop in small quantities totalling approximately 250 kilograms.

87. All refuelling and maintenance of vehicles, plant and other machinery is proposed to take place well above the quarry pit floor on a bunded and roofed concrete pad. The applicant proposes to service this area with an interceptor system.

88. The applicant has not provided any information on the capacity or maintenance required for the interceptor system proposed.

89. The applicant proposes to maintain spill kits at the site and undertake spill response in accordance with the applicant's spill response guideline in the event of a spill or leak of fuel or other hazardous substance.

Duration

90. The applicant has requested the following consent durations:

    a. An unlimited duration for all land use consents; and

    b. A duration of 35 years for all discharge permits and the water permit.

LEGAL AND PLANNING MATTERS

The Resource Management Act 1991 (RMA)

91. Section 9 of the RMA states that:

> *"(1) No person may use land in a manner that contravenes a national environmental standard unless the use—*
>
> *(a) is expressly allowed by a resource consent; or*
>
> *(b) is allowed by section 10; or*
>
> *(c) is an activity allowed by section 10A; or*
>
> *(d) is an activity allowed by section 20A.*
>
> *(2) No person may use land in a manner that contravenes a regional rule unless the use—*
>
> *(a) is expressly allowed by a resource consent; or*
>
> *(b) is an activity allowed by section 20A…"*

92. There are no National Environmental Standards that permit the proposed use of land to excavate or deposit material and the proposed activity contravenes a regional rule, therefore a resource consent (land use consent) is required. In the sections below, I have undertaken an assessment of the relevant regional plan rules.

93. Section 14 of the RMA states that:

> *(1) No person may take, use, dam, or divert any open coastal water, or take or use any heat or energy from any open coastal water, in a manner that contravenes a national environmental standard or a regional rule unless the activity —*
>
> *(a) is expressly allowed by a resource consent; or*
>
> *(b) is an activity allowed by section 20A.*
>
> *(2) No person may take, use, dam, or divert any of the following, unless the taking, using, damming or diverting is allowed by subsection (3):*
>
> *(a) water other than open coastal water; …*
>
> *(3) A person is not prohibited by subsection (1) from taking, using, damming, or diverting any water, heat, or energy if—*
>
> *(a) The taking, use, damming, or diversion is expressly allowed by a rule in a regional plan [and in any relevant proposed regional plan] or a resource consent; or*
>
> *(b) In the case of fresh water, the water, heat, or energy is required to be taken or used for—*
>
> *(i) An individual's reasonable domestic needs; or*
>
> *(ii) The reasonable needs of an individual's animals for drinking water,—*
>
> *and the taking or use does not, or is not likely to, have an adverse effect on the environment; or…*
>
> *(e) The water is required to be taken or used for fire-fighting purposes.*

94. The proposed use of water is not expressly allowed by a National Environmental Standard or a rule in a regional plan, therefore a resource consent (water permit) is required. In the sections below, I have undertaken an assessment of the relevant regional plan rule.

95. Section 15 of the RMA states that:

> *(1) No person may discharge any—*
>
> *(a) Contaminant or water into water; or*
>
> *(b) 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*
>
> *(c) Contaminant from any industrial or trade premise into air; or*
>
> *(d) Contaminant from any industrial or trade premises onto or into land—*
>
> *unless the discharge is expressly allowed by a national environmental standard or other regulations, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.*
>
> *(2) No person may discharge a contaminant into the air, or into or onto land, from a place or any other source, whether moveable or not, in a manner that contravenes a national environmental standard unless the discharge—*
>
> *(a) Is expressly allowed by other regulations; or*
>
> *(b) Is expressly allowed by a resource consent; or*

(c) Is an activity allowed by section 20A.

(2A) No person may discharge a contaminant into the air, or into or onto land, from a place or any other source, whether moveable or not, in a manner that contravenes a regional rule unless the discharge—

(a) Is expressly allowed by a national environmental standard or other regulations; or

(b) Is expressly allowed by a resource consent; or

(c) Is an activity allowed by section 20A…

96. The proposed discharge of contaminants into air is not expressly allowed by a National Environmental Standard or rule in a regional plan, therefore a resource consent (discharge permit) is required. The discharge of stormwater, washdown water and other contaminants into land is not expressly allowed by a National Environmental Standard or rule in a regional plan, therefore a resource is required. In the sections below, I have undertaken an assessment of the relevant regional plan rule.

Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (NESAQ)

97. In accordance with Section 44A(7) and (8) of the RMA, every consent authority must observe and enforce a National Environmental Standard to the extent to which their powers enable them to do so.

98. The NESAQ are regulations made under the RMA which came into effect on 8 October 2004. The NESAQ aims to set a guaranteed minimum level of human health protection by addressing emissions into air from a range of contaminants[13], of most relevance to this application are the emissions of PM_{10}.

99. Regulation 13 of the NESAQ sets ambient air quality standards for contaminants in Schedule 1. Concentrations of PM_{10} must not exceed the threshold concentrations of PM_{10} set out in Schedule 1 of the NESAQ, unless the exceedance is a permissible exceedance.[14]

100. Regulation 17 of the NESAQ directs a consent authority to decline an application for a resource consent to discharge PM_{10} if the discharge to be expressly allowed by the consent would be likely, at any time, to increase the concentration of PM_{10} (calculated as a 24-hour mean under Schedule 1 of the NESAQ) by more than $2.5\mu/m^3$ in any part of a polluted airshed, other than the site on which the consent would be exercised.

101. Regulation 17(3) states Regulation 17(1) does not apply where:

(a) the consent authority is satisfied that the applicant can reduce the PM_{10} discharged from another source or sources into each polluted airshed to which subclause (1) applies by the same or a greater amount than the amount likely to be discharged into the relevant airshed by the discharge to be expressly allowed by the proposed consent; and

(b) the consent authority, if it intends to grant the proposed consent, includes conditions in the consent that require the reduction or reductions to take effect

[13] Including particulate matter, carbon monoxide, oxides of nitrogen, volatile organic compounds, sulphur dioxide and greenhouse gas emissions from landfills.
[14] As defined in section 13(3) of the NESAQ.

within 12 months after the consent is granted and to then be effective for the remaining duration of the consent.

102. This is referred to as an *"offset".*

103. The site of the proposed quarry is not located within a *Gazetted* Airshed, but is directly adjacent to the *Gazetted* Christchurch Airshed. Regulation 17(4)(a) sets out the criteria for an airshed to be considered *"a polluted airshed"*. The *Gazetted* Christchurch Airshed meets the criteria of Regulation 17(4)(a).

104. I consider the fugitive discharge of dust proposed in this application is a relevant assessment matter for Regulation 17 of the NESAQ, this matter is also discussed in detail in the section 42A Report of Ms Ryan. In my view, there is no discretion provided in Regulation 17(1), whether the discharge is temporary or fugitive is irrelevant, the crucial factor for determining compliance with Regulation 17 is whether the discharge allowed by the consent would be <u>likely, at any time,</u> to increase the concentration of PM_{10} (calculated as a 24-hour mean under Schedule 1 of the NESAQ) by more than 2.5µ/m^3.

105. I consider that for the air discharge permit to be granted, the Hearings Panel must be satisfied that the applicant has demonstrated the discharge will not cause an increase of PM_{10} (calculated as a 24-hour mean under Schedule 1 of the NESAQ) of more than 2.5µ/m^3. Alternatively, the Hearings Panel must be satisfied that the requirements of Regulation 17(3) can be met and an "offset" can be achieved. At the time of writing this section 42A Report, the applicant has not provided the information required by Regulation 17(3) to confirm that an offset can be achieved. Given this, I do not consider an "offset" in the context of the NESAQ is able to be achieved at the time of writing this report.

Regional Plans

106. There are two operative regional plans relevant to proposed activities:

    a. The Canterbury Land and Water Regional Plan (CLWRP); and

    b. The Canterbury Air Regional Plan (CARP).

107. I have undertaken an assessment of the relevant rules of each regional plan in the assessment below.

<u>Canterbury Land and Water Regional Plan (CLWRP)</u>

108. The CLWRP is the operative regional plan for the Canterbury Region. The purpose of the CLWRP is to identify the resource management outcomes or goals for managing land and water resources in Canterbury to achieve the purpose of the RMA. It identifies the policies and rules needed to achieve the objectives and provides direction in terms of processing resource consent applications.

109. The CLWRP operates at two levels:

    a. A region-wide level which contains objectives, policies and rules that apply across the region; and

    b. A sub-region level where ten sections contain catchment specific policies and rules to achieve the objectives of the CLWRP in the most appropriate manner for those catchments.

110. In this case, the relevant sections of the CLWRP include the region-wide provisions and those included in Section 11 'Selwyn Te Waihora' of the CLWRP. Sub-regional rules in Section 11 prevail over the region-wide rules.

111. The CLWRP was made operative on 1 February 2017. Plan change 1[15] to the CLWRP which is relevant to the Selwyn Te Waihora zone where the proposed quarry is located, was made operative on 1 February 2016.

112. Proposed Plan Change 7 to the CLWRP (PC7) was notified on the 20 July 2019, after the lodgement and notification of this application. In accordance with section 88A(1A) of the RMA, the application continues to be processed, considered and decided as an activity that it was for, or was treated as, at the time the application was first lodged. Pursuant to section 88A(2), consideration has been had to proposed PC7 in accordance with section 104(1)(b).

Use of water for dust suppression and other ancillary quarry activities

113. Rule 5.6 of the CLWRP provides a discretionary activity status for an activity that would contravene section 14(2) of the RMA. As there is no specific rule in the CLWRP that manages the use of water for dust suppression, aggregate washing and other ancillary activities, and the activity proposed contravenes section 14(2) of the RMA (by not being expressly allowed by section 14(3)) the use of water proposed must be assessed as a **discretionary activity**. This rule assessment is supported by the Memorandum prepared by Wynn Williams.

Discharge permit to discharge stormwater into land where contaminants may enter groundwater

114. Rule 5.96 of the CLWRP provides a permitted activity rule for the discharge of stormwater onto or into land where contaminants may enter groundwater. The discharge is unable to comply with condition (2)(d) as the proposed use of land is not for residential, educational or rural activities.

115. As such, the discharge of stormwater to land must be assessed as a **discretionary activity** in accordance with Rule 5.97.

Discharge permit to discharge contaminants into land where contaminants may enter groundwater associated with the deposition of cleanfill for site rehabilitation

116. Rule 5.98 of the CLWRP provides a 'catch all' permitted activity status for the discharge of water or contaminants onto or into land in circumstances where a contaminant may enter groundwater that is not classified by any other rule in the CLWRP.

117. The discharge of contaminants associated with the deposition of cleanfill at the site is unable to comply with condition (1) as the discharge may exceed 10m³ per day or an application rate of 10 millimetres per day. As such, the discharge must be assessed as a **discretionary activity** in accordance with Rule 5.100.

Use of land to excavate material

118. Rule 5.175(2) of the CLWRP provides the permitted activity framework for the use of land to excavate material over an unconfined or semi-confined aquifer. The use of land for excavation is unable to comply with condition (b)(ii) as the excavation is proposed to be undertaken within 50 metres of a surface waterbody.

119. On this basis, the use of land to excavate material must be assessed as a **restricted discretionary activity** in accordance with Rule 5.176. In assessing the actual and potential adverse effects of this activity. In accordance with the rule, discretion is restricted to the following matters:

---

[15] Introducing policies, rules and limits to Section 11 of the CLWRP to manage water quality and water quanity in the Te Waihora/Lake Ellesmere catchment.

1. *The actual and potential adverse environmental effects on the quality of water in aquifers, rivers, lakes, wetlands; and*
2. *Any need for remediation or long-term treatment of the excavation; and*
3. *The protection of the confining layer and maintaining levels and groundwater pressures in any confined aquifer, including any alternative methods or locations for the excavation; and*
4. *The management of any exposed groundwater.*

Use of land to deposit cleanfill over an unconfined/semi-confined aquifer

120. Rule 5.177 of the CLWRP provides a controlled activity status authorising the use of land for the deposition of more than 50m³ of material in any 12 month period.[16]

121. The applicant considers they are able to meet the conditions of Rule 5.177, therefore the use of land to deposit cleanfill over an unconfined/semi-confined aquifer is a **controlled activity**. CRC are unable to refuse a consent for a controlled activity[17], however in assessing the actual and potential adverse effects of the proposed activity, the CRC reserves control over the following matters:

1. *The potential for adverse effects on the quality of water in aquifers, rivers, lakes, wetlands and mitigation measures; and*
2. *The content and adequacy of the management plan prepared in accordance with Section 8.1 and Appendix B of "A Guide to the Management of Cleanfills", Ministry for the Environment, January 2002.*

Section 11 of the CLWRP: Selwyn – Te Waihora

122. Section 11 of the CLWRP includes policies and rules specific to the Selwyn-Te Waihora sub regional zone defined in the CLWRP and Canterbury Water Management Strategy (CWMS).

Discharge permit to discharge contaminants into water from an industrial or trade process within the Selwyn-Te Waihora sub-region

123. Rule 11.5.28 of CLWRP Section 11 provides a discretionary activity rule for the discharge of any wastewater, liquid waste or sludge waste from an industrial or trade process into or onto land.

124. The applicant considers the discharge water washed off hardstand surfaces at the site is consistent with the discharge of 'liquid waste' covered by Rule 11.5.28. There is no definition of 'liquid waste' in the CLWRP or guidance to assist in the application of this rule. As Rule 11.5.28 prevails over region-wide Rule 5.91 and 5.92 in the CLWRP, I agree that Rule 11.5.28 is the most relevant rule for assessment on this occasion.

125. It is assessed by the applicant that all conditions of this rule are able to be met and a discretionary activity status is achieved. As I understand it, the discharge of hardstand washdown water is unlikely to contain substantial amounts of nitrogen and

[16] Where land is excavated to a depth in excess of 5 metres below the natural land surface and is located over an unconfined or semi-confined aquifer, where the seasonal high water table is less than 5 metres below the deepest point in the excavation.
[17] As required by section 104A(a) of the RMA.

will not contribute to an exceedance of the nitrogen load limit, therefore condition (1) is able to be met.

126. As such, I agree the discharge is able to be undertaken as a **discretionary activity** in accordance with Rule 11.5.28.

Use of water for dust suppression and other ancillary quarry activities

127. There are no rules in Section 11 of the CLWRP that specifically provide for the 'use' of water. Therefore, the region-wise rules must be relied on as assessed above.

Permitted Activities

128. The following activities managed under the provisions of the CLWRP have been assessed as permitted activities by the applicant:

Discharge of a dust suppressant onto or into land

129. Rule 5.18 of the CLWRP manages the discharge of a dust suppressant onto or into land. The applicant considers they are able to comply with condition (2) as the dust suppressant used at the site will be approved under the Hazardous Substances and New Organisms Act 1996. On this basis, I agree that the discharge of dust suppressant onto or into land is able to be undertaken as a **permitted activity**.

Hazardous substance storage

130. Rule 5.179 of the CLWRP is a permitted activity rule managing the use of land for the storage and use of a hazardous substance listed in CLWRP Part A of Schedule 4. The applicant considers they are able to meet all conditions of Rule 5.179, therefore no resource consent is required. I agree with the applicant's assessment and consider the use and storage is able to be undertaken as a **permitted activity**.

Canterbury Air Regional Plan (CARP)

131. The proposed Canterbury Air Regional Plan seeks to implement a new air quality management framework for Canterbury. The CARP was made operative on 31 October 2017.

132. If the Hearings Panel are satisfied Regulation 17(1) of the NESAQ is able to be complied with, or is not relevant as the applicant is able to achieve an offset in accordance with Regulation 17(3), I have provided an assessment of the relevant rules in the CARP below.

Discharge permit to discharge contaminants into air from large scale fuel burning devices

133. Rules 7.26 to 7.30 of the CARP provide for the discharge of contaminants into air from large scale fuel burning devices. The applicant proposes to operate both mobile and fixed plant at the site, therefore Rules 7.26 (discharge from moveable large scale fuel burning device) and 7.30 (discharge from any large scale fuel burning device) are applicable.

134. The applicant did not provide an assessment of these rules in their original application and was requested to provide an assessment of the relevant rules in the request for further information. In their first further response the applicant incorrectly provided an assessment of the rules relevant to external combustion, instead of internal combustion.

135. Rule 7.26 provides for discharges of contaminants into air from the internal combustion of diesel in any moveable large-scale fuel burning device with a combined net electrical output capacity of up to 500kW. On the basis of information provided by the applicant to date, the combined net electrical output of the mobile plant is likely to be greater than 500kW (electrical output from mobile plant is

considered to be between 0.26 to 0.52MW). Therefore Rule 7.26 is not relevant to the activity proposed.

136. Rules 7.27 to 7.29 provide for internal combustion resulting from emergency electricity generation. The applicant has not proposed to undertake activities of this nature; therefore these rules are not relevant.

137. Rule 7.30 provides a discretionary activity status for the discharge of contaminants into air from the internal combustion of fuel in any large-scale fuel burning device that is unable to comply with the conditions of Rule 7.26 to 7.29 or that is not otherwise managed by a rule in the CARP. I do not consider there are any other rules in the CARP relevant to the operation of mobile and fixed plant at the site, therefore discharges from this source must be assessed as a **discretionary activity** and resource consent is required.

Discharge permit to discharge contaminants into air from an industrial or trade premise or process

Discharge of dust into air from unsealed surfaces and unconsolidated land

138. Rule 7.32 of the CARP manages the discharge of dust into air beyond the boundary of the property of origin arising from unsealed surfaces or unconsolidated land which is relevant to all unconsolidated surfaces at the proposed quarry. The applicant did not include an assessment of this rule in their application. Condition (2) is able to be complied with as the area of unsealed surface or unconsolidated land at the site is proposed to be greater than 1000m^2 at any one time, and the applicant proposes to implement a dust management plan in accordance with Schedule 2 of the CARP. With regards to condition (3), on the basis that the applicant rigorously implements the dust mitigation measures proposed, I do not consider the discharge of dust into air from unsealed surfaces and unconsolidated land will have an effect that is objectionable or offensive beyond the property boundary.

139. As the conditions of Rule 7.32 can be complied with the discharge of contaminants into air from unsealed land or unconsolidated surfaces at the site is assessed as a **permitted activity**.

Discharge of contaminants into air from the handling of bulk solid materials

140. Rule 7.35 of the CARP provides the permitted activity criteria for the discharge of contaminants into air from the handling of bulk solid materials. 'Handling' is defined in the CARP as

"Extraction, quarrying, mining, processing, screening, conveying, blasting, or crushing of any material."

141. 'Bulk solid materials' are defined in the CARP as:

"materials consisting of, or including, fragments that could be discharged as dust or particulate. These materials include but are not limited to: gravel, quarried rock, fertiliser, coal, cement, flour, rock aggregate, grains, compost and woodchip."

142. The applicant has assessed that they are unable to comply with condition (2) and (6) of Rule 7.35 as the rate of handling will exceed 100 tonnes per hour and the discharge is proposed to occur within 200 metres of a sensitive activity.[18]

143. As the conditions of Rule 7.35 are unable to be complied with, the discharge must be assessed as a **discretionary activity** under Rule 7.63(2) below.

Discharge of contaminants into air from the outdoor storage of bulk solid materials

[18] Defined in the CARP as the area within 20 metres of the façade of an occupied dwelling.

144. Rule 7.36 of the CARP manages the discharge of contaminants into air from the outdoor storage of bulk solid materials.

145. The applicant provided an assessment of Rule 7.36 of the CARP and considers all relevant conditions are able to be met, with the exception of condition (5). Condition (5) requires that the discharge is not within 100 metres of a sensitive activity, wāhi tapu, wāhi taonga or place of significance to Ngāi Tahu that is identified in an Iwi Management Plan. As the applicant proposes to maintain a setback of 250 metres between site boundaries and stockpiles, I do not consider a discharge of contaminants into air from the outdoor storage of bulk solid materials will occur within 100 metres of a sensitive activity. Given this, I disagree with the assessment of Rule 7.36 provided by the applicant and consider the discharge of contaminants into air from the outdoor storage of bulk materials can be undertaken as a **permitted activity**.

Discharge of contaminants into air from the disposal of cleanfill

146. Rule 7.49 of the CARP provides the permitted activity criteria for the discharge of contaminants into air arising from the disposal of cleanfill. The applicant has assessed that the activity is unable to comply with condition (2) of Rule 7.49 as the activity is unable to meet the required separation distances.

147. As the condition (2) of Rule 7.49 has been indicated by the applicant as unable to be met, the proposal must be assessed under Rule 7.63 of the CARP.

Overall activity status achieved under the CARP

148. Rule 7.63(2) provides a direct discretionary activity status for the discharge of contaminants into air that is from an industrial or trade premise that is not managed Rules 7.47 – 7.62 of the CARP.

149. A submission made by Brackenridge Services Limited (Brackenridge) opposes the application in its entirety and considers "extraction or quarrying of material" is not an industrial or trade process and therefore the site is unable to be considered an industrial or trade premise.

150. The CARP refers to the definition of industrial or trade process in the RMA as follows:

"includes every part of a process from the receipt of raw material to the dispatch or use in another process or disposal of any product or waste material, and any intervening storage of the raw material, partly processed matter, or product."

151. Similarly, the CARP refers to the definition of industrial or trade premise in RMA as follows:

"means

a. any premises used for any industrial or trade purposes; or
b. any premises used for the storage, transfer, treatment, or disposal of waste materials or for other waste-management purposes, or used for composting organic materials; or
c. any other premises from which a contaminant is discharged in connection with any industrial or trade process;

but does not include any production land."

152. In my view, the activities proposed by the applicant are consistent with the definition of industrial or trade process or premise in the CARP, and meet clause (a) of the above definition. I note that this approach was adopted by the Hearings Panel in the

decision on applications to CRC made by Road Metals Company Limited.[19] All other dust producing activities proposed at the site (not already provided for by the CARP listed above) form part of the industrial or trade activity undertaken at the site and are therefore subject to the **discretionary activity** status provided by Rule 7.63(2).

ACTIVITY STATUS SUMMARY

153. The activity statuses of each activity can be summarised as follows:

Proposed Activity	Regional Plan	
	CLWRP	**CARP**
Use of land for excavation	Restricted Discretionary Activity (Rule 5.176)	N/A
Use of land to deposit cleanfill	Controlled (Rule 5.177)	N/A
To discharge contaminants into water from an industrial or trade process in the Selwyn Te-Waihora sub-region	Discretionary (Rule 11.5.28)	N/A
To discharge stormwater into land where contaminants may enter groundwater	Discretionary (Rule 5.97)	N/A
Water permit to use water for aggregate water for dust suppression, aggregate washing and other ancillary quarrying activities	Discretionary (Rule 5.6)	N/A
To discharge contaminants into air from the internal combustion of diesel	N/A	Discretionary (Rule 7.30)
To discharge contaminants into air from an industrial or trade premise or process	N/A	Discretionary (Rule 7.63)

Table 1: Activity status summary

BUNDLING

154. Where more than one activity is proposed, and those activities are inextricably linked, best practice is that the activity statuses are bundled and the most restrictive activity status applies to the entire proposal.

155. In this case, I do not consider the applicant would be able to exercise the land use consents[20] applied for to the Regional Council to the extent proposed, unless the associated discharge permits, and water permit were also exercised. Given this, I consider the consents are inter-dependent and subsequently should be decided as a cohesive activity set.

[19] Application for Resource consents RMA/2017/2111& CRC181274 by Road Metals Company Limited Decision of Hearing Commissioners, 16 May 2018.
[20] Land use consents for excavation and deposition of matrial.

156. As such I consider bundling of the proposed activities as a **discretionary activity** to be appropriate.

157. Where there is sufficient overlap and consequential flow on effects between the consents applied for under the relevant district and regional plans, there is the opportunity to bundle across both plans applying a consistent activity status. In this case, I do not consider bundling is appropriate as the two consent authorities have responsibility for different aspects and issues arising from the proposal. On this basis, I do not consider bundling the consent applications to the regional council and territorial authority to be appropriate in this case. In any event, I understand that Mr Henderson has determined that the District Council land use consents are required to also be assessed as a discretionary activity.

DESCRIPTION OF THE AFFECTED ENVIRONMENT

158. The applicant has provided a description of the affected environment in Section 3.0 of the AEE (Page 4) which accompanied the application and within the attached technical reports. I have audited the applicant's description using Canterbury Maps and the advice of the technical experts. I generally agree with the description provided by the applicant and have provided a summary on the key characteristics below including the identification of any aspects of the description provided by the applicant which I disagree with.

    a. The site is located within Selwyn-Te Waihora CWMS Zone and classified as 'Rural' in the Selwyn District Plan.

    b. The topography of the site is flat and is predominantly pasture with rows of shelterbelts and other infrastructure typical of a site used for agricultural purposes.

    c. An established shelterbelt is located along the entirety of the Curraghs Road (western) site boundary. Shelterbelts are located along portions of the Maddisons Road (northern) and Dawsons Road site boundaries. There is no shelterbelt currently present along the Jones Road (southern) site boundary. Other areas of exotic vegetation and shelterbelts are located throughout the applicant's site.

    d. There are two existing access points to the site, one located at the Jones Road site boundary, the other along Dawsons Road.

    e. The surrounding area is a combination of farming (consisting of both intensive and pastoral), rural residential, residential, commercial and community land uses.

    f. The applicant has provided a thorough assessment of the sensitive receptors (mostly dwellings) located within 500 metres of the proposed quarry face.[21] Within 500 metres there are 35 sensitive receptors, of these 15 are located within 250 metres. Two dwellings are located within 100 metres of the proposed quarry face. The closest sensitive receptor is a residential dwelling[22] located 19 metres from the proposed quarry face.

    g. The site is located just outside of the Gazetted Christchurch Airshed, the boundary of the airshed is directly parallel to the Dawsons Road site

[21] See page 17 and Table 2, page 30, Appendix D, Air Quality Assessment (and Draft Dust Management Plan), November 2018.
[22] 319 Maddisons Road

boundary. As above, the Gazetted Christchurch Airshed is considered 'polluted' in accordance with the NESAQ.

h. Land parcels directly east of the applicant's site (173 Maddisons Road) are owned by Christchurch City Council (CCC). According to the CCC District Plan, 173 Maddisons Road is currently zoned Rural Urban Fringe Zone and is not designated from any particular purpose at the time of writing this section 42A Report.

i. The Templeton township is located east of the applicant's site. The nearest street in the Templeton township is Iraklis Close located approximately 760 metres from the site.

j. The site is located over of the unconfined/semi-confined aquifer system and is not located within the Christchurch Groundwater Protection Zone.

k. According to piezometric contours, groundwater generally flows in a north to south direction beneath the site.

l. The nearest Community Drinking Water Supply point is the Claremont Supply[23] located approximately 600m south-east of the site (M36/7575). The well is owned by SDC and registered on the Drinking-water Register for New Zealand as a Small Community/Rural Supply for 101 to 500 people.

m. According to CRC's well database, there are 30 wells listed as being used for domestic supply within 1 kilometre of the site.

n. Groundwater quality in the area can be generally described as good quality, with low dissolved solids, suitable for a range of uses.

o. There are two water races that terminate to soakage within the site. It is understood these form part of the Paparua Scheme operated by SDC.

p. A portion of the site is listed on CRC's Listed Land Use Register for HAIL activity 'A8 – Livestock dip or spray race operations'. This site has not been investigated by CRC.

q. The site is located within the takiwā of Te Ngāi Tūāhuriri Rūnanga and Te Taumutu Rūnanga.

r. The site is located within the Selwyn -Waimakariri Groundwater Allocation Zone. This zone is currently considered overallocated with respect to groundwater abstraction and it is a prohibited activity to take new water in this zone.

s. There are no known archaeological sites, waahi tapu sites or other sites of significance to Ngāi Tahu located at the site.

ASSESSMENT OF ACTUAL AND POTENTIAL EFFECTS

159. As acknowledged above, this report only covers the assessment of actual and potential effects which are relevant to the Regional Council aspects of the proposal. The assessment of District Council aspects are covered in the report of Mr Henderson.

160. The applicant provided an assessment of the actual and potential effects of the proposal in Section 6.0 of the AEE (Page 29) which accompanied the application and the first further information response.

[23] Ministry of Health Source Number: G01673, Ministry of Health Supply Number: CLA005.

161. In auditing the applicant's assessment of actual and potential adverse effects of the activities proposed, I have relied on expertise within the CRC (including CRC Principal Consent Planner Ms Jacqui Todd, CRC Scientists and CRC Monitoring and Compliance staff), Ms Deborah Ryan (Technical Director – Air Quality PDP Ltd), my own experience from auditing similar applications and the objectives and policies of the Canterbury Regional Policy Statement, CLWRP and CARP. I have also relied on legal advice from Wynn Williams.

162. My audit of the applicant's assessment is structured as follows:

a. Application of Permitted Activity Baseline

b. Actual and potential nuisance and health effects arising from the discharge of dust into air

    i. Nature and sources of dust

    ii. Compliance with Regulation 17(1) of the NESAQ

    iii. Air Quality Assessment Framework

    iv. Establishment of background air quality and sensitivity of the receiving environment

    v. FIDOL Assessment

    vi. Assessment Summary

    vii. Mitigation and Monitoring

    viii. Response to Submissions

    ix. Summary

c. Actual and potential adverse effects on groundwater quality and users

    i. Actual and potential adverse effects on groundwater quality arising from the excavation of aggregate;

    ii. Actual and potential adverse effects on groundwater quality arising from the deposition of cleanfill;

    iii. Actual and potential adverse effects on groundwater quality arising from the discharge of stormwater and other contaminants into land (excluding the discharge of contaminants arising from the deposition of cleanfill into land);

    iv. Actual and potential adverse effects on groundwater quality arising from site remediation at the conclusion of cleanfilling and future land use;

    v. Actual and potential adverse effects on public water supplies (M36/7575);

    vi. Ongoing monitoring of groundwater quality;

    vii. Summary;

d. Actual and potential adverse effects on groundwater quantity and water levels in nearby wells;

e. Actual and potential adverse effects on soil resources;

f. Actual and potential adverse effects arising from contaminated land

g. Actual and potential adverse effects on Ngāi Tahu cultural values.

h. Positive effects

Application of the Permitted Activity Baseline

163. Section 104(2) states that when forming an opinion for the purpose of section 104(1)(a), a consent authority may disregard an adverse effect of the activity on the environment if a National Environmental Standard or relevant plan permits an activity with that effect.

164. I do not consider application of the permitted baseline is appropriate due to the variabilities associated with the discharge of dust into air.

Actual and potential nuisance and health effects arising from the discharge of dust into air

165. The discharge of the dust beyond the site boundaries resulting from the proposed activities has the potential to create nuisance and health effects. In the sub-sections below, I have undertaken an assessment of these effects arising from the discharge proposed, including an assessment of compliance with the NESAQ and an audit of the information provided by the applicant.

166. This assessment of effects should be read in conjunction with the section 42A report of Ms Deborah Ryan.[24]

167. Adverse effects on air quality was one of the most cited reasons for submitters opposing the proposal in relation to the regional council consents required. Concerns varied among submitters and included:

    a. Community health (particularly young, old and those with compromised immunity or existing respiratory illnesses), respite care, educational facilities and places of worship (Templeton Primary School, Templeton Kindergarten, Brackenridge Services Limited and Samadhi Buddhist Virhara);

    b. Nuisance effects on residential dwellings, gardens, vehicles and other community facilities;

    c. Effects on local industry and commercial operations (including orchards, market gardens, plant nurseries, livestock, accommodation facilities and racehorse breeding and training operations);

    d. Effects on water quality (including water races and rainwater collection tanks); and

    e. Effects on the operation of Christchurch International Airport (specifically effects on aviation safety during take-off and landing).

168. As set out in the 'Description of the Proposed Activity' of this report, the applicant has proposed two sets of trigger values for dust monitoring. The first set of trigger values were proposed as part of the initial application, the second were proposed in the form of proposed draft conditions in the second further information response. Based on advice from Ms Ryan, the most recent set of trigger values appear to be higher (less conservative) than proposed in the initial application. The applicant did not provide an assessment which confirms the appropriateness of adopting higher trigger values and due to time constraints, the conclusions reached in Ms Ryan's section 42A report and below, are based on adopting the lower (more conservative) trigger values proposed in the initial application.

[24] Appended as Appendix 1.

Nature and sources of dust

169. The principal contaminant of concern is dust or particulate matter discharged as a result of the establishment and operation of the site as a quarry. Potential dust sources include:

    a. Site preparation (eg: topsoil and overburden removal and bund construction to establish the quarry pit);

    b. Aggregate extraction, transfer and processing (via fixed and mobile plant) and stockpiling;

    c. Haul roads;

    d. Aggregate loadout; and

    e. Backfilling, cleanfilling and site rehabilitation.

170. Both the applicant and Ms Ryan agree the following factors influence dust generation:

    "surface disturbance eg: traffic on haul roads; material processing; moisture content; exposed area; wind speed and particle size."

171. The applicant and Ms Ryan also agree that dust discharges can result in both nuisance and health effects. Health effects (including those on cardiovascular and pulmonary systems) are generally associated with particulate matter smaller than 10 microns (also known as PM_{10}), whereas coarser fractions are typically associated with nuisance effects.

172. The CARP provides the following commentary in relation to the health effects of PM_{10}:

    "PM is identified by reference to size, as either PM_{10} or $PM_{2.5}$. PM_{10} comprises particles less than 10 microns while $PM_{2.5}$ particles have a diameter less than 2.5 microns. PM can penetrate deep into the lungs and even into the bloodstream if the particles are ultrafine. Damage to the respiratory and circulatory systems results. Those most at risk are young children, the elderly and people suffering from respiratory and cardiovascular disease. Air quality standards and guidelines have been established for PM_{10} at a national level, however there is currently no New Zealand guideline for $PM_{2.5}$."

173. As set out in the application, nuisance effects include impacts on amenity, visibility and on structures.

174. There are also expected to be discharges of combustion gasses (including oxides of nitrogen and carbon monoxide) resulting from the operation of large-scale fuel burning devices at the site (fixed and mobile plant). It is agreed by the applicant and Ms Ryan that the effects of combustion gasses discharging from the site will be less than minor. Given this, I have not considered the discharges from combustion gasses further.

Compliance with the NESAQ

175. The NESAQ and regulations of most relevant to this application are introduced in the 'Legal and Planning' section of this report.

Regulation 13 and 14 of the NESAQ

176. Regulation 13 and Schedule 1 of the NESAQ specify the ambient air quality standards. For PM_{10} the Regulations set an ambient air quality concentration limit of 50 $\mu g/m^3$ as a 24-hour average.

177. The applicant does not expect that ambient off-site concentrations will approach or exceed the NESAQ standard for PM_{10} of 50 µ/m^3. Ms Ryan's assessment highlights that background air quality at the applicant's site has had concentrations of PM_{10} close to the ambient air quality standard (45 µg/m^3 as a 24-hour average) and concludes, in her view, there is not enough information to be conclusive that the NESAQ ambient air quality standard would not be breached.

178. As I understand it, Regulation 13 is aimed at providing a guaranteed level of health protection for New Zealanders and requires that contaminants must not exceed the threshold concentrations in an airshed, unless the exceedance is a permissible exceedance (as defined by the NESAQ). Regulation 14(2) of the NESAQ allows an ambient air quality standard for a contaminant to not apply to the site on which a resource consent is exercised. Regulation 17(1) of the NESAQ is the mechanism for resource consent applications to assist in managing to the ambient air quality standards in Schedule 1 of the NESAQ.

179. The proposed quarry site is located adjacent to the *Gazetted* Christchurch Airshed, this is considered a 'polluted airshed' in the context of the NESAQ, this is due to there being more than one exceedance of the ambient air quality standard for PM_{10} per 12-month period. PM_{10} exceedances in the polluted Christchurch Airshed are typically associated with the increased use of home heating during winter months.

Regulation 17(1) of the NESAQ

180. The applicant considers they are able to comply with the PM_{10} threshold in Regulation 17(1) of the NESAQ. Appendix D of the application makes the following comments in establishing compliance with the NESAQ:

> *"given the nature of the discharges from quarry sites and the proposed management practices, the proposed Roydon Quarry is very unlikely to contribute a more than negligible amount of PM10 to concentrations in the Christchurch airshed."*

181. The applicant provided further information on this matter which was assessed by Ms Ryan. On the basis of information provided at this stage, Ms Ryan states:

> *"In my view, there is a possibility that PM_{10} concentrations could be impacted within the airshed to a level where the increase is more than the 2.5 µg/m³ as a 24-hour average allowable under the NESAQ, at least at sometime within the life of the consent. For example, an impact of this level, could conceivably occur when bund construction is occurring along the boundary with the airshed particularly if a high wind event occurred during construction and bund materials dried out."*[25]

182. Ms Ryan also considers that the additional monitoring data as analysed by the applicant in the response to the first further information request is unable to be used as definitive support that Regulation 17(1) is able to be complied with.

183. As commented in the 'Legal and Planning' section of this report, I consider there is no discretion provided in Regulation 17(1) for temporary or fugitive discharges, the crucial factor for determining compliance with Regulation 17(1) is whether the discharge allowed by the consent would be <u>likely at any time</u>, to increase the concentration of PM_{10} (calculated as a 24-hour mean under Schedule 1 of the NESAQ) by more than 2.5µ/m^3.

184. On the basis of the information available at the time of drafting this report, the applicant has not demonstrated the discharge would not be likely at any time, to increase the concentration of PM_{10} in the polluted airshed by more than 2.5 µ/m^3. Therefore, I do not consider the applicant is able to comply with Regulation 17(1).

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[25] Paragraph 75 of Ms Ryan's evidence.

185. There are some exceptions where Regulation 17(1) does not apply. The applicant's response to further information refers to the option of an offset as it is anticipated the applicant's operation at Pound Road will reduce as the proposed Roydon Quarry becomes operational. The 2011 Users' Guide to the revised National Environmental Standards for Air Quality: Updated 2014 (the Users' Guide) describes an "offset" as:

"The act of reducing or removing a source of PM_{10} emissions to remove those emissions from the airshed."

186. The intent of the Regulations is to ensure polluted airsheds (those that breach the ambient PM_{10} standard) can still accommodate significant new emitters without air quality being compromised further. Without emissions being offset, new activities would not be able to establish as existing emissions would have effectively 'used up' the allocation within the airshed.

187. Regulation 17(3) sets out the criteria which must be met for a discharge to be "offset". The intent of Regulation 17(3)(a) is that:

"emissions from other sources are reduced or removed to the extent that emissions from the new (or increased) emitter are offset."

188. It is my understanding that the mass of PM_{10} which constitutes this offset is *"the same or greater amount than the amount likely to be discharged"*.

189. Regulation 17(3)(b) requires conditions to be included in the consent (if it is granted) requiring the reduction or reductions to take effect within 12 months after the consent is granted and to then be effective for the remaining duration of the consent.

190. At the time of drafting this report, the applicant has not provided information such that I am satisfied they can reliably reduce PM_{10} discharged from another source, nor has the applicant proposed a condition which requires the reductions to take effect 12 months following the grant of a resource consent (if it is able to be granted). Therefore, based on the opinion of Ms Ryan that Regulation 17(1) could be contravened, and offsets that meet the requirements of Regulation 17(3) have not been proposed, my recommendation is that Regulation 17(1) of the NESAQ requires the application to be declined.

191. There is the ability for the applicant to provide additional information through expert conferencing, caucusing or at the hearing on whether Regulation 17(1) can be complied with or an offset can be achieved in accordance with Regulation 17(3). If the Hearing Panel are satisfied Regulation 17(1) of the NESAQ is able to be complied with or is not relevant as the applicant is able to achieve an offset in accordance with Regulation 17(3), I have provided an assessment of the effects of dust discharges and an assessment of the relevant objectives and policies of the Canterbury Regional Policy Statement and the CARP.

Air Quality Assessment Framework

192. The Air Quality Assessment provided with the application sets out a number of assessment thresholds intended to provide a measure of whether a discharge is likely to result in a health, amenity or nuisance effect. A detailed assessment of all relevant air assessment criteria is provided in Ms Ryan's report.

193. To summarise, there are several components which form the assessment framework for determining effects on air quality. Schedule 1 of the NESAQ includes a 24-hour average standard for PM_{10} of 50 μ/m^3, this standard is set to provide a guaranteed level of protection for the health of all New Zealanders and is discussed in detail above.

194. Respirable crystalline silica (RCS) is a subset of particulate matter that has recently been raised as a potential health issue related to the discharge of dust from quarries.

There is no standard in the NESAQ for RCS, the assessment criterion used is a Chronic Reference Exposure Level (CREL) of 3 µg/m³ as an annual average.

195. According to the applicant there is limited information available to quantify the nuisance and amenity effects. Ms Ryan refers to the subjective assessment criteria referred to in the MfE Dust Guide (2016) which states:

"There shall be no noxious, dangerous, objectionable or offensive dust to the extent that it causes an adverse effect at or beyond the boundary of the site."

196. As stated by Ms Ryan this is typically assessed by considering the FIDOL factors. The applicant has provided a FIDOL assessment which has been audited by Ms Ryan and is discussed in the latter sections of this assessment.

197. The CARP does not set quantitative air quality thresholds, rather the objectives seek that ambient air quality provides for the health and wellbeing of the people of Canterbury (Objective 5.2) and degraded ambient air quality is improved over time (Objective 5.4). Policy 6.1 of the CARP sets a narrative threshold that discharges of contaminants into air do not cause:

a. *Adverse effects on human health or wellbeing;*

b. *Adverse effects on the mauri and life supporting capacity of ecosystems, plants or animals; or*

c. *Significant diminished visibility; or*

d. *Significant soiling or corrosion of structures or property.*

198. I consider the CARP sets a very low threshold of 'no adverse effects' on human health or wellbeing or the mauri and life supporting capacity of ecosystems plants or animals. While the NESAQ provides a higher threshold, which provides a guaranteed level of health protection for all New Zealanders.

199. In determining adverse effects of PM_{10} on human health I have relied on the ambient air quality standard in the NESAQ, in terms of the adverse effects of RCS on human health I have relied on the assessment criterion in the CREL. To determine the adverse effects on amenity resulting from nuisance dust I have relied on the analysis of FIDOL factors.

Establishment of background air quality and sensitivity of the receiving environment

200. To establish background air quality, the applicant has relied on information sourced from an air quality monitoring program around the quarries at Yaldhurst (Mote, 2018). This study was commissioned by CRC, in collaboration with CDHB and intended to investigate the impacts of dust and RCS from quarry operations in response to public concerns and to characterise short term concentrations of PM_{10} and $PM_{2.5}$.

201. The study included monitoring at the proposed Royden Quarry site (as "Site 4"), which was used to indicate the background air quality for the study as typical for a rural area on the fringe of Christchurch. The following excerpts from Ms Ryan's report summarises the findings of the study in relation to particulate matter at Site 4 and RCS:

"The maximum measured concentration of PM_{10} at Site 4, using the standard method, beta attenuation monitor (BAM), was 45 µg/m^3 as a 24-hour average, which is compared with the NESAQ of 50 µg/m^3. On five days, over the 4-month monitoring programme, concentrations of PM_{10} were greater than 30 µg/m^3 as a 24-hour average. The overall 4-month average PM_{10} was 16 µg/m^3 at the Royden site."[26]

[26] Paragraph 51 of Ms Ryan's evidence.

"Measured $PM_{2.5}$ levels were low, with Figure 8 of the Mote report showing 24-hour average $PM_{2.5}$ at Royden as being around 10 µg/m^3 or less compared to the reporting guideline of 25 µg/m^3 as a 24-hour average."[27]

202. Ms Ryan's report makes the following comments with regards to concentrations of RCS:

"RCS was not found to be at levels of concern in the vicinity of the quarries, with most measurements being below detection limits. Where RCS was detected, the measured levels indicate concentrations would be well below the annual exposure criteria of 3 µg/m^3."[28]

203. I agree with the conclusions drawn by Ms Ryan with respect to background air quality at the site.

204. In terms of the meteorology and topography information referred to by the applicant, Ms Ryan makes the following comments:

"Golder identifies that dry conditions and strong winds have the most potential to give rise to dust emissions. And that the direction of the prevailing winds will determine where impacts are most likely to occur. I agree that soil moisture levels and wind speed and direction are key considerations relating to the potential for impacts from dust and these have been appropriately accounted for in Golder's assessment

Golder synthesised wind data for the site using measurements from nearby monitoring locations, using the metrological model CALMET, and developed a wind rose for the Royden Quarry site. I agree with Golder's approach. The wind rose shown in Figure 10 of the Air Quality Assessment shows the strongest winds and prevailing winds are from the northeastern quarter, with strong winds also from the southwestern quarter, and from the northwest. Sensitive receptors downwind of these directions will be susceptible to dust, particularly under strong winds and dry conditions.

As part of the application process for these consents, Fulton Hogan has collected wind data at the proposed quarry site. The results of the onsite monitoring as presented in Figure 12 of the Air Quality Assessment, indicate the CALMET windrose is representative of the actual conditions and I agree that it is reliable for use in the assessment."[29]

205. As set out in Ms Ryan's Report, the sensitivity of the receiving environment is a key consideration influencing the potential for adverse effects from dust. Separation of dust producing activities from sensitive locations does help to mitigate the potential effects because dust settles on the ground surrounding the source. Background air quality, meteorology and topography also influence the potential for emissions of dust and likely impacts of dust discharges.

206. The applicant has provided a description of the receiving environment and sensitivity of receptors. It was identified that within 500 metres of the proposed quarry boundary there are 28 residential dwellings, 15 of these are located within 250 metres of the proposed quarry boundary, 2 of these are located less than 100 metres from the proposed quarry boundary (319 Maddisons Road[30] and 153 Curraghs Road[31])

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[27] Paragraph 52 of Ms Ryan's evidence.
[28] Paragraph 53 of Ms Ryan's evidence.
[29] Paragraphs 55, 56 and 57 of Ms Ryan's evidence.
[30] Referred to as R3 in the applicant's Air Quality Assessment
[31] Referred to as R11 in the applicant's Air Quality Assessment

207. The applicant proposes to excavate the entire site in stages while maintaining setbacks of 20 metres to site boundaries and 100 metres to the closest residential dwellings at 319 Maddisons Road and 153 Curraghs Road. The applicant has proposed conditions which enables land within the 100 metre setback to residential dwellings 319 Maddisons Road and 153 Curraghs Road to be excavated in the event written approval is obtained from these landowners and occupiers.

208. Other setback distances of particularly dusty activities are also proposed by the applicant as set out in the description of the proposal. Ms Ryan makes the following comments with respect to the likely sensitivity of the receiving environment:

"Those receptors within a distance of 250 metres are more susceptible to the impacts of dust, particularly quarry establishment and construction activities that are proposed to occur close to the boundary. For fixed processing plant, separation distances are maximised by the proposed location of the plant within the centre of the site."[32]

209. I agree with the advice from Ms Ryan and highlight that the 250 metre separation distance is consistent with the recommendations made in the Victorian Environmental Protection Agency (EPA Victoria) separation distance guidelines (2013). Overall, I consider it is the 15 dwellings located within 250 metres of the proposed quarry site that are highly sensitive to potential dust impacts. The dwellings at 319 Maddisons Road and 153 Curraghs Road are of highest sensitivity to dust impacts from the proposed quarry site.

FIDOL Assessment

210. According to the MfE's good practice guidance for assessing and managing dust, nuisance effects of dust emissions are influenced by the nature of the source, sensitivity the receiving environment and individual perception. Whether dust has an effect that is objectionable, or offensive depends on the frequency, intensity, duration, offensiveness/character and location of the discharge, these are collectively known as the FIDOL factors.

211. The following excerpt is from Ms Ryan's section 42A report:

"Golder has applied the FIDOL factors to assess if there is high, medium or low risk of dust impacts on neighbours in the vicinity of the quarry. I agree this is a reasonable approach and that this methodology helps to identify critical areas or activities that require additional or high level mitigation measures."[33]

212. Ms Ryan also agrees with the Air Quality Assessment provided by the applicant in determining the most at risk properties for dust impacts based on the FIDOL assessment. I agree with Ms Ryan's assessment.

Assessment Summary

213. Ms Ryan has made the following conclusions based on the applicant's assessment:

    a. *"The nearest residents to the quarry boundary, Receptor 3 (319 Maddisons Road) and Receptor 11 (151 Currughs Road) are both less than 100 metres to the quarry boundary and are therefore at most risk of some increase in dust levels, particularly during bund the construction. In my view, a high level of dust control will be needed during construction to ensure that there is no offensive or objectionable dust to the extent that there is an adverse effect*

[32] Paragraph 46 of Ms Ryan's evidence.
[33] Paragraph 59 of Ms Ryan's evidence.

on these properties. Measures should include pre-dampening materials and avoiding works in strong dry winds.

b. *Considering the FIDOL factors, properties down wind of the worst case wind, assessed as properties to the south-west, are at most risk of increased dust from the ongoing quarry operations. For these properties (and others in other directions), if the monitoring trigger levels and management controls are complied with, then in my view, dust emissions will be adequately mitigated to ensure that: the amenity values associated with the area will be maintained; significant soiling will be avoided; and there will be no adverse effect on plants or animals. Given that Golder has identified that there are 15 dwellings, within 250 metres of the quarry boundary, which does not meet the minimum separation distance guidelines recommended from EPA Victoria, a high level of vigilance in applying dust controls will be needed. In my view, the particulate matter trigger monitoring and management responses will be important for ensuring the CARP objectives and policies can be met for this proposal.*

c. *The levels of $PM_{2.5}$ and RCS will not be increased to levels where ambient air quality will cause adverse effects on human health (or animal health) effects. And based on monitoring data from Yaldhurst, I do not consider that a 500 metre buffer as recommended by EPA Victoria is necessary to mitigate the effects of RCS.*

d. *In my view, there is uncertainty as to whether regulation 17(1) of the NESAQ Regulation for PM_{10} can be complied with, in which case some form of off-set condition would need to be considered. I am of the view that the potential cumulative effects of PM_{10} from the quarry with background cannot be assessed as "not expected to approach or exceed" the NESAQ of 50 $\mu g/m^3$ as a 24-hour average as assessed by Golder in the Air Quality Assessment, Section 6.2. But I agree given the dust controls proposed, that the level of increase will be minor, so that the community will not be impacted to a more than minor extent."*[34]

214. Based on the advice from Ms Ryan, I consider it is dwellings within 250 metres of the proposed quarry site that are highly sensitive to effects. As stated by Ms Ryan, I consider a high level of dust control is required by the applicant to ensure dust is supressed as far as practicable and objectionable and offensive discharges are avoided.

215. I have undertaken an assessment of the mitigation and monitoring proposed by the applicant in the sections below.

Mitigation and Monitoring

216. The applicant has proposed a range of general and targeted mitigation measures to avoid, reduce or manage the production of dust at the site. Ms Ryan's report provides a list of the measures identified by the applicant. Both the applicant and Ms Ryan agree that the dust mitigation measures proposed demonstrate that the proposal meets accepted good practice for dust management. Ms Ryan's report also acknowledges additional mitigation measures that have not formed part of the application to date but were discussed during the site visit.

217. Ms Ryan considers works to prepare the site for quarrying (scraping of overburden, and bund construction) are the highest risk activities, particularly for the closest dwellings at 319 Maddisons Road and 151 Curraghs Road and those downwind of the prevailing north easterly wind. Ms Ryan agrees with the applicant that:

[34] Paragraph 83 of Ms Ryan's evidence.

"strict management of these works will be needed to avoid adverse effects from dust nuisance, in particular, ensuring materials are damp and avoiding unfavourable wind conditions."

218. The following conclusions are made by Ms Ryan in relation to the suite of dust mitigation measures proposed by the applicant:

"many of the proposed management measures require judgement from operators, for example, frequency of water cart use, drop height minimisation and limiting vehicle speeds during dry conditions. Therefore, the effectiveness of the measures is linked to staff training and buy-in; and support from company and site management, particularly when there are time and cost constraints that may impact the priority assigned for dust control. It needs to be acknowledged that management plans do not control dust, rather automated systems and ultimately people do. Policies on staff training and responsibilities for dust management measures and monitoring are typically set through the DMP.

A failure of controls will not always result in adverse effects because there are other dependencies, but the more system failures there are, the higher the risk of off-site adverse effects occurring."[35]

219. In addition to dust mitigation measures, the applicant has also proposed to undertake continuous monitoring for dust at the site boundaries as follows:

a. A permanent real-time PM_{10} monitor is proposed to be installed and operated at the eastern boundary, directly downwind of the active quarry area for southwest wind conditions; and

b. A mobile real-time Total Suspended Particulate (TSP) and PM_{10} monitor is proposed to be located between the active quarrying/cleanfilling area and off-site sensitive locations that are 500 metres from the active areas.

220. The applicant considers the proposed approach to monitoring is consistent with CRC's requirements for boundary monitoring where there are residential dwellings within 500 metres of a quarry.

221. The applicant has proposed the following trigger values[36] and associated actions for dust management as follows:

a. 60 µ/m³ of PM_{10} as a 1-hour average for taking immediate actions to investigate and reduce site dust emissions; and

b. 70 µ/m³ of PM_{10} as a 1-hour average for ceasing all quarry activities (other than dust suppression activities) and taking immediate actions to investigate and reduce site dust emissions.

222. Quarry operations are also proposed to cease (other than dust suppression activities) when:

a. Windspeeds are greater than 7 m/s (rolling hourly average); and

b. When site activities are occurring within 250 metres from receptor locations along the south-eastern boundary and when winds are from the northwest to northeast (310°N to 50°N); or

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[35] Paragraphs 115 and 116 in Ms Ryan's evidence.

[36] As noted in the introductory sections to 'Actual and potential nusiance and health effects arising from the discharge of dust into air' this assessment is based on the the trigger levels proposed in the applicant's Air Quality Assessment, not the new trigger levels proposed in the second response to further information.

c. When site activities are occurring within 250 metres from receptor locations along the north-western boundary and when winds are from the south to southwest (170°N to 230°N); and

d. During dry weather conditions (E.g: not practicable to keep surfaces visibly damp).

223. Mr Ryan considers the trigger values are set at an appropriately conservative basis for managing dust to minimise the likelihood of adverse effects. Mr Ryan is supportive of the applicant's proposal to undertake continuous-permanent dust monitoring and states the following:

"I agree with CRC (and Golder) that continuous monitoring is desirable as a management measure. In my view, continuous monitoring should encourage a more proactive and preventative approach is taken to applying dust management measures. To ensure good management it will be important that dust monitors are appropriately located relative to activities and receptors. I agree with the additional monitoring proposed by Golder for dwellings at Receptors 3 and 11.

Golder recommends that the monitors be fitted with automated alarms with set trigger levels with notification to an appropriate person for taking immediate action to reduce dust. I agree with the proposed trigger levels and actions in response to monitoring. I consider that the proposed trigger levels are appropriately conservative to achieve proactive management for avoiding dust nuisance effects on amenity.

I agree that the monitoring will provide a check on the adequacy of dust controls and a trigger for investigation where dust levels are starting to be elevated. This will include times when people are not present at the site, so that dust management measures will be triggered when needed outside of working hours.

I agree with the proposal for onsite monitoring and logging of wind direction, wind speed and rainfall, which will assist in management of activities on-site to reduce the potential for dust and assist with any investigations."[37]

224. I agree with the conclusions made by Ms Ryan and have recommended conditions be included which require the implementation of the dust mitigation measures and monitoring as proposed by the applicant. At this stage, I have not recommended conditions which require the implementation of additional mitigation measures discussed at the site visit and seek confirmation from the applicant that such measures form part of the application.

225. Several dust mitigation measures proposed by the applicant rely on sufficient volumes of water being available to allow the suppression of dust as, and when required. The applicant was requested to quantify how water will be managed within the consented limits for the uses proposed. The applicant has provided a water demand assessment setting out the annual and peak daily demand for each of the uses proposed. Based on the annual volume calculated by CRC, the applicant does not have access to an adequate volume of water to meet their anticipated demand, therefore the applicant may not be able to effectively undertake their proposed dust suppression mitigation.

226. Based on Ms Ryan's advice I consider the dust mitigation measures proposed by the applicant is consistent with good management practice for dust management. I consider the implementation of several measures are highly reliant on human judgement to ensure adverse effects are minimised for receptors within 250 metres. I agree with Ms Ryan that the use of metrological and dust monitoring and trigger values will inform what measures should be implemented at the site and provide a

[37] Paragraphs 121, 122, 123 and 124 of Ms Ryan's evidence.

measure of adverse effects at the site boundary, but will not supress the production of dust itself. Additionally, several measures are reliant on the availability of water to supress dust, at this stage it is unclear whether the applicant has sufficient water available to minimise dust and therefore whether adverse effects can be adequately mitigated.

Response to Submissions

227. As mentioned above, effects on air quality was one of the most cited reasons for submitters opposing the proposal. Specific concerns relating to air quality varied and are outlined in more detail in the sections below.

228. Several submissions highlighted specific concerns related to the potential impacts on health. A submission made by CDHB is neither in support or opposition of the applicant's proposal but seeks additional mitigation and increased setbacks than those proposed. Brackenridge Services Limited provides residential accommodation for a number of people with high health needs. Brackenridge raise concerns that those with high health needs are predisposed to bronchial health issues resulting from the discharge of dust. The Ministry of Education and Templeton Primary School Board of Trustees submitted raising concerns with regards to the discharge of dust on educational facilities. A high number of other submitters identified concerns relating to the health effects resulting from dust.

229. A number of submissions were received opposing the proposal due to effects on the Samadhi Buddhist Virhara. It is understood the submitter's activity at their site has been operating without the necessary consents from SDC and therefore the activity, as a whole, does not form part of the existing environment.[38] While I recognise the submitters operation, as a whole, does not form part of the existing environment, I have assessed the effects on the Samadhi Buddhist Virhara as if it were a dwelling in the Rural Zone. I note that the policy guidance requires the same outcomes irrespective of whether there is a place of worship or house at this site. That is, no offensive or objectionable effects beyond the site boundary, and no adverse health effects. This is discussed in further in the sections below.

230. Several submissions were received in opposition of the proposal identifying concerns on horse breeding and training operations and effects on other grazing animals and pasture.

231. Southern Woods Nursery and NZ Motor Caravan Operation submitted in opposition raising concerns with regards to the effects of dust on their business operations.

232. Air New Zealand submitted in opposition of the proposal, Christchurch International Airport Limited's submitted a neutral position, both citing concerns regarding dust and potential impacts on aviation safety.

233. A large number of submissions in opposition also raise concerns regarding potential nuisance effects arising from the discharge of dust. Reasons for this were varied, including the ability to dry washing outdoors, additional cleaning and maintenance of exterior house fixtures and potential impacts on roof water supplies.

234. While opposing the applicant's proposal, several propose alternative or additional mitigation measures not included in the application.

235. In response to submissions, Ms Ryan has made the following comments in her Section 42A Report:

"Continuous monitoring of PM_{10} using the trigger levels set out in paragraph 25 of my report will, in my view, provide a basis for proactive management to ensure the

[38] This matter is addressed in further detail in the section 42A Report of Mr Henderson.

level of dust control across the site is adequate. Given Fulton Hogan's proposed mitigation measures, I consider the proposed quarry can be managed in a way that more than minor adverse effects on vegetation, including pasture and gardens in the surrounding area will be avoided.

The potential effects of particulate matter on the health of humans and animals are managed by achieving compliance with the NESAQ for PM_{10}. The NESAQ is set for the protection of the health of all New Zealanders including the infirm. The PM_{10} guidelines and standards are predominantly based on epidemiology of human population exposures for public health protection (WHO, 2005). The New Zealand NAAQGs states that "animals are likely to be protected from guidelines established to protect human health but the possibility of extremely sensitive species being adversely affected at such levels cannot be ruled out" (MfE, 2002).

The background PM_{10} measured for the proposed Royden Quarry site, Site 4 in the Yaldhurst monitoring study, was typically below 30 µg/m³ as a 24-hour average, with a maximum measurement of 45 µg/m³ as a 24-hour average.

As discussed in paragraph 68 of my report, in my view, there is not enough data to be conclusive about the cumulative effect of the quarry plus background PM_{10}. With a high level of dust control, however, any increase in PM_{10} experienced in the community is likely to be low, so that the effect on human health and animals will not be impacted to more than a minor extent."[39]

236. Based on conclusions made by Ms Ryan, I consider there could be adverse effects as a result of the applicant's proposal, however it is likely adverse effects would be minor in nature, given the mitigation and monitoring proposed.

237. With regards to the concerns raised by the NZ Motor Caravan Association, Ms Ryan concludes that given the mitigation controls proposed and separation distance to the quarry, it is unlikely there would be dust nuisance effects experienced at the NZ Motor Caravan Association's site.

238. Ms Ryan's report makes the following comments in response to the submissions made citing the actual and potential adverse effects on plants including pasture and residential gardens:

"As indicated above, for effects on vegetation and pasture, proposed mitigation and continuous monitoring of PM_{10} mean that the proposed quarry operations can be managed in a way that will avoid more than minor adverse effects on vegetation and pasture from dust deposition beyond the site. Similarly, issues such as soiling of washing, windows, solar panels and general deposition can be mitigated to the extent that more than minor adverse effects can be avoided."[40]

239. Similarly, in response to submitters raising concerns with regards to impacts on the use of roof water supplies, Ms Ryan makes the following comments in her report:

"Effects of dust on roof rainwater could be of concern if the dust contained toxic contaminants. Provided that any potentially contaminated materials are appropriately managed and contained, if excavated, the majority of the dust emissions from the quarry will be relatively inert. Golder was asked to provide further information on dust impacts on roof water supplies in the S92 questions. The S92 Response (March 2019) stated that measures to reduce dust nuisance effects to an acceptable level will be sufficient to minimise dust effects on water supplies. I agree with Golder that the potential effect on water supply is more of a nuisance issue than a health concern. If dust controls did fail, additional dust loadings from the quarry

[39] Paragraphs 86, 87, 88 and 89 of Ms Ryan's evidence.
[40] Paragraph 93 of Ms Ryan's evidence.

operation could add additional cleaning costs, such as frequency of changing filters or cleaning out tanks."[41]

240. At this stage the applicant has not proposed conditions requiring the maintenance or cleaning of neighbouring properties, rather the applicant has relied on proposing methods to minimise and suppress dust from being produced as discussed in the section above.

241. Ms Ryan has also considered the submissions which propose alternative or additional mitigation measures than those proposed by the applicant. Ms Ryan's report makes the following comments in response to these:

"The draft DMP sets out many of the aspects of dust management and monitoring sought by the submitters, at least to some degree. Dust management, however, relies on a combination of factors with multiple control points. What is appropriate will vary in time and space depending on conditions and activities. Dust management is typically adaptive of the prevailing conditions, hence the use of management plans rather than prescription of measures, which may not be practicable or necessary at all times."[42]

242. As discussed in the 'Mitigation and Monitoring' section above, implementation of several measures as proposed by the applicant are reliant on human judgement and the diligent and consistent implementation of the range of dust mitigation measures proposed.

Summary

243. Overall, Ms Ryan considers the proposal is consistent with good management practice, control and monitoring for dust discharges at quarries. The following conclusions are made in Ms Ryan's report:

"There is a potential that Regulation 17(1) of the NESAQ, relating to an increase in PM_{10} in a polluted airshed, may not be complied with, or at least it is not possible to be conclusive about this. There may be offsets available for the Royden Quarry PM_{10} emissions from a possible reduction in activity at Pound Road. If this does occur it should result in a net reduction in emissions in the Christchurch airshed, although at the time of writing I understand that the applicant has not committed to or demonstrated how such an offset would be achieved to the extent required by the NESAQ.

Overall, subject to mitigation, the discharges of dust from the proposed Roydon Quarry are not expected to result in more than minor impacts on amenity or nuisance from dust deposition. Air quality is expected to be maintained at acceptable levels for health effects relative to applicable air quality guidelines and standards for RCS and $PM_{2.5}$. PM_{10} will be minimised through the proposed mitigation for dust control and monitoring with dust trigger levels, which are expected to be conservative. Any increased exposure to PM_{10} from the quarry operation in the surrounding community is generally expected to be low, so that any effects on human health in the population will be no more than minor. Continuous monitoring for PM_{10} and wind monitoring, linked to management actions, such as ceasing dust generating activities, will be critical to ensuring the activity is managed to avoid adverse effects."[43]

244. As mentioned above, if Regulation 17(1) is unable to be met and an offset is unable to be achieved in accordance with Regulation 17(3), the Consent Authority is directed to decline the application for resource consent. If the applicant is able to provide information which shows that Regulation 17(1) is able to be met, or an offset

[41] Paragraph 92 of Ms Ryan's evidence.
[42] Paragraph 97 of Ms Ryan's evidence.
[43] Paragraphs 130 and 131 of Ms Ryan's evidence.

is proposed in accordance with Regulation 17(3), the option to grant the resource consent is available.

245. Based on advice sought from Ms Ryan, even with the implementation of good practice dust mitigation measures and use of monitoring to inform onsite decision-making, there is still the potential for minor adverse effects beyond the site boundary on those properties within 250 metres of the proposed quarry site.[44] Several dust mitigation measures proposed by the applicant are reliant on human judgement to ensure effective implementation. Dwellings located at 319 Maddisons Road and 153 Curraghs Road are located in extremely close proximity from the proposed quarry site meaning there is no ability for error or complacency when implementing mitigation measures.

246. In terms of adverse effects of PM_{10} on human health as a result of the proposal, I consider there is uncertainty in the level of adverse effects that may be experienced, this is due to difficulties in establishing compliance with Regulation 17(1) of the NESAQ. I consider the current application, may have potential to cause adverse effects on human heath that are minor by causing brief exceedances of the 2.5µ/m³ PM_{10} threshold in the polluted Christchurch Airshed. Given this, I do not consider the applicant's proposal is consistent with the lower threshold of 'no adverse effects on human health or wellbeing' as set out by the CARP. In relation to RCS, as concluded by Ms Ryan, I do not consider the proposal will result in an increase of RCS that will result in adverse effects on human health.

247. In term of adverse effects on amenity and nuisance dust, I consider the applicant's proposal is likely to result in nuisance effects that are minor for those within 250 metres of the proposed quarry site. This is based on the separation distances in the Victoria EPA Guidelines and vigilant implementation of dust mitigation measures proposed by the applicant. At this stage, the applicant does not have enough water available for all uses proposed at the site, therefore the applicant's ability to effectively manage dust is jeopardised and those within 250 metres could be subject to nuisance and amenity effects that are more than minor.

Actual and potential adverse effects on groundwaters quality and users

248. The extraction of aggregate, deposition of cleanfill and associated discharges from ancillary activities have the potential to cause adverse effects on groundwater quality and users. In the sub-sections below, I have undertaken an assessment of the adverse effects on groundwater quality arising from each activity proposed.

249. This summary of adverse effects should be read in conjunction with the section 42A report of Dr Lisa Scott[45] and Mr Freeman.[46]

250. Several submissions raised concerns regarding adverse effects on wells used for domestic water supplies and effects on groundwater quality more generally.

Actual and potential adverse effects on groundwater quality arising from excavation of aggregate

251. During excavation of aggregate the greatest risk to groundwater quality is exposure of groundwater at the base of the quarry pit and infiltration of contaminants through a reduced depth of unsaturated material separating groundwater from the land surface.

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[44] Including the effects on the Samadhi Buddhist Virhara.
[45] Appended as Appendix 2
[46] Appended as Appendix 3

252. Submissions from a number of submitters including Te Taumutu Rūnanga, Waipuna Halswell Hornby Riccarton Community Board and the Templeton Residents Association raised concern with regards to the maximum quarry pit depths proposed and the adequacy of information used to inform proposed depths.

253. The applicant considers the adverse effects arising from the excavation of aggregate are likely to be less than minor. This is based on past experience with other quarry operations and case law.[47] In the applicant's view, maintaining one metre separation to seasonal highest groundwater levels at the site and implementation of operational controls (such as securing the site and ensuring machinery is well-maintained) will provide ongoing mitigation to manage the actual and potential adverse effects on groundwater quality and users.

254. The applicant initially proposed to excavate the entire site to a maximum depth of 9.9 metres below ground level, based on the applicant's assessment of seasonal highest groundwater level at the site not exceeding 10.9 metres below ground level. According to the analysis of groundwater level information held by CRC, it was found that due to variable seasonal high groundwater levels across the site, the applicant would only be able to excavate to a depth of 9.9 metres in the northwest area of the site and 8.1 metres in the southeast area of the site to ensure one metre to seasonal highest groundwater levels were maintained as proposed. Based on this, the applicant amended their proposal to restrict excavation depths across the site to between 8.1 and 9.9 metres below ground level and to allow for a further period of monitoring (five years) to ensure a depth of 9.9 metres below ground level can be achieved across the entire site (while maintaining a separation distance of one metre to seasonal highest groundwater level). Conditions to this effect were proposed by the applicant in their first response to additional information[48] and a contour map of proposed quarry excavation levels across the site relative to mean sea level was also provided.

255. Advice from Dr Scott confirms the following in terms of the one metre of separation between the quarry pit floor and seasonal highest groundwater level as proposed by the applicant:

"The reasons for restricting the maximum depth of quarrying to one metre above highest groundwater level in Canterbury are not widely documented, but I understand they were introduced as a measure to prevent future flooding hazards for post-quarry land use. Managing the quarry to this depth is important because it helps to minimise the risk of excavators working directly in groundwater during periods when the water table is high. It also minimises the chance of fill materials being periodically saturated with groundwater after the excavations are filled, which decreases the leaching risk."[49]

256. Dr Scott agrees with the proposed excavation depths (as amended following the first response to further information) and considers the excavation depths are relatively conservative. However, she acknowledges the following:

"Managing the quarry depth to one metre above the highest groundwater level is generally expected to provide some buffer between the quarry floor and highest groundwater. However, it should be recognised that the errors in extrapolating groundwater levels at this scale are probably greater than the one metre buffer itself. The projected highest groundwater levels are likely to be more accurate for the south east side of the site, because the monitoring wells used in the analysis are all on this

[47] Application references Road Metals Company Ltd v CCC Environment Court Decision C163/05.
[48] Dated March 2019
[49] Paragraph 44 of Dr Scott's evidence.

side. There will be greater uncertainty about the highest groundwater level on the north west side.

There is also uncertainty in how the levels may behave in future. Climate-driven declines in recharge and increased abstraction over the past few decades have contributed to general decreasing trends in groundwater levels across the Central Canterbury Plains.[50] *But the Central Plains Water Scheme is also anticipated to cause some small future increase in groundwater levels that may reach this area*[51] *from irrigation recharge and farmers switching from groundwater abstraction to scheme surface water."*[52]

257. In response to the applicant's proposal to monitor groundwater depths for a five-year period following the commencement of excavation at the site (if resource consents are granted), Dr Scott makes the following comments:

"The applicant intends to refine the highest groundwater level estimates with measurements from on-site monitoring wells over the first 5 years of the consent and use this information to guide the depth of excavations. This could help to reduce the uncertainties about the depth to highest groundwater, if water levels in the onsite wells can be correlated with long-term monitoring wells further away. But, given the general long-term variability in groundwater levels in the area, 5 years of monitoring from the site alone would be unlikely to provide a high level of confidence that groundwater will not be able to rise into the excavations or the backfilled materials in future, especially if the entire quarry is excavated to 9.9 m deep."[53]

258. On the basis of advice from Dr Scott, I agree that maintaining a one metre separation to seasonal highest groundwater at the site will provide adequate protection to groundwater during excavation and note such a restriction is typical of other resource consents for quarrying activities in the Canterbury Region.[54] I accept Dr Scott's comments relating to the general long-term variability in groundwater levels in the area, and her concerns relating to the relatively short timeframe proposed by the applicant to undertake groundwater level monitoring at the site. As such, I do not recommend conditions that enable the applicant to achieve a maximum depth of 9.9 metres across the entire site and recommend the maximum depth should be limited to:

    a. 9.9 metres below natural ground level in the northwest area of the site; and

    b. 8.1 metres below natural ground level in the southeast area of the site.

259. Dr Scott's report also provides comment on the mitigation measures proposed by the applicant. Dr Scott supports the inclusion of the following measures as resource consent conditions (if resource consents are granted):

    a. No excavation below one metre above the highest groundwater level defined for quarry management.

    b. Establishment of a surveyed datum point and regular surveys of quarry depth to ensure that excavation depths are within agreed limits.

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[50] Alkhaier, F, M Hanson and H Zarour 2019: Trends in groundwater levels in the Central Plains of Canterbury, Environment Canterbury Technical Report No. R19/18, February 2019.

[51] Weir, JJ 2009: Supplementary Evidence of Julian James Weir. Hearing evidence for applications by Central Plains Water Trust to Canterbury Regional Council for resource consents to take and use water from the Waimakariri and Rakaia Rivers.

[52] Paragraphs 37 and 38 of Dr Scott's evidence.

[53] Paragraph 39 of Dr Scott's evidence.

[54] Eg: CRC181274

c. To assist in monitoring compliance, preparation of an annual contour map showing the surveyed maximum quarry depth relative to the highest groundwater level.

d. No machinery working in accidently exposed groundwater.

e. Maintaining vehicles and equipment to prevent oil and fuel leaks.

f. A spill management plan and spill kit to be onsite at all times.

g. For the maximum excavation depth to be limited to 9.9 metres below natural ground level in the northwest area of the site and 8.1 metres below natural ground level in the southeast area of the site, as shown on the contour plan provided by the applicant and appended to consent conditions

260. I agree with the conclusions made by Dr Scott and have recommended conditions requiring implementation of the mitigation measures listed above. I consider mitigation measures proposed by the applicant and supported by Dr Scott, are typical of similar sites in the Canterbury Region.

261. Dr Scott agrees with the applicant that hydrocarbon spills or leaks from machinery and vehicles, from hazardous substances storage and refuelling operations pose a potential risk to groundwater quality and groundwater users. From a contaminated land perspective, Mr Freeman's evidence also highlights the storage and dispensing of hydrocarbons and other hazardous chemicals to be of greatest risk to the groundwater resource. The applicant proposes to bund fuel tanks and for any refuelling to occur adjacent to the bunded fuel tanks on a covered concrete refuelling pad. In the first further information response the applicant notes that:

"…from time-to-time portable tankers may be used on site including up until such a time as a permanent tank is erected on site. The site procedure for refuelling with such tankers will be that it takes place on either a hard stand or compacted surface well away from the working quarry floor. The dispenser on the fixed diesel tank will be covered to shelter from rain and will contain a self-bunded area (similar to a drip-tray) with refuelling to occur adjacent to this tank on a covered concrete refuelling pad. As noted previously, the refuelling area could be in the form of a drive through area which could also be used for vehicle servicing if need be and could also be used by mobile tankers prior to a fixed tanker being installed…"

262. The applicant does not propose a location for the permanent tank or drive through area as mentioned in the excerpt above. To minimise the potential for any spills and the impact they may have, Dr Scott recommends that no refuelling of vehicles should take place within the excavated quarry pit and the use of catch trays under refuelling connectors over unsealed ground. The applicant proposes to periodically refuel fixed and mobile plant in the quarry pit.

263. I agree with this mitigation measure and have recommended conditions to this effect.

264. Mr Freeman acknowledges the applicant's proposal to manage spills in accordance with a spill management plan, but seeks that the applicant is bound by a timeframe to provide a spill management plan to CRC for review. I agree with this and have recommended a condition requiring a spill management plan to be maintained at the site and provided to CRC to confirm that it is sufficient. I have also recommended a condition requiring the clean up of any spill to be undertaken in accordance with the spill management plan.

265. In the event depths have been over-estimated while excavating and groundwater rises into the quarry pit following a period of high groundwater levels, the applicant proposes to fill areas with 'virgin material' sourced from the quarry and will remove all heavy machinery from the areas. Dr Scott agrees this this an appropriate

mitigation method and considers CRC should be notified in the event such actions are required. The applicant does not define 'virgin material' in their application or response to further information. Dr Scott considers 'virgin material' would be defined as the following:

"material from within the quarry pit that is of comparable quality and composition to that which was excavated, or preferably, replace the same original material if it has not yet been processed."[55]

266. I support the conclusions of the applicant and Dr Scott and have recommended conditions requiring the filling of areas with virgin material in the event excavation depths have been over-estimated, or groundwater rises into the pit. I have also recommended a condition which defines 'virgin material' in accordance with Dr Scott's evidence.

267. Based on the advice provided in Dr Scott's report and careful implementation of the resource consent conditions as recommended, I consider the adverse effects arising from the excavation of aggregate material to be less than minor.

Actual and potential adverse effects on groundwater quality arising from the deposition of cleanfill

268. The applicant proposes to replace the excavated natural strata with cleanfill material imported to the site. The deposition of cleanfill material is proposed to serve as a site rehabilitation measure and provide a 'buffer' between activities on the land surface and groundwater. The applicant considers the actual and potential adverse from the deposition of cleanfill will be less than minor due to:

    a. The material deposited will be only cleanfill material as defined by the CLWRP; and

    b. The base of the quarry pit floor being above the expected seasonal highest groundwater levels means that it is unlikely the material will become saturated.

269. Dr Scott's report considers:

"even with strict cleanfill management, contaminants released from the proposed Roydon Quarry and cleanfill may cause some degradation in the aesthetic properties (e.g. hardness, taste, potential discoloration) of high-quality groundwater below the deposition site. However, this contamination would likely be low impact, localised and dissipate within a few hundred metres of the fill areas. I am not aware of any sites where truly 'clean' fill deposition has had a significant adverse effect on groundwater quality or caused exceedances of health-based drinking-water limits.

Uncontrolled filling of waste materials can have adverse effects on groundwater, as seen in many old rubbish pits around Canterbury. Careful management of the fill materials for both obvious and unseen contaminants (e.g. contaminated soils) is critical for the long-term protection of groundwater quality."[56]

270. As outlined in the Description of the Affected Environment above, according to CRC's well records there are 36 active wells within 500 metres of the site. Dr Scott's report considers that those wells are either up-gradient or cross gradient from the site and should not experience any effects from the site at normal domestic rates of pumping. Dr Scott extended the well search distance to one kilometre down gradient (south-east of the site) which was the furthest distance that any distinguishable effect above background concentrations could be observed in the Yaldhurst study. Dr Scott

[55] Paragraph 103 of Dr Scott's evidence.
[56] Paragraphs 78 and 79 of Dr Scott's evidence.

considers it highly unlikely that any noticeable difference in groundwater quality will be found beyond this distance. The following comments are made by Dr Scott:

"Excluding the two wells on the site, there are 30 wells within the 1 km downgradient zone.

Five of the wells are registered for "domestic" and eight for "domestic and stock water" supplies. Some of the wells may no longer be in use if the records have not been updated. There could also be other wells within the area that are not recorded in CRC's database as these records are not field checked. In general, I assume that every dwelling not on a water reticulation network is supplied by a private domestic well.

Some domestic wells very close to the downgradient side of the site (along Jones Road/Main South Road) might be able to notice a small change in the quality of water from the proposed activities. A further 12 wells are recorded as being used for irrigation supply, which could also possibly be affected by scaling/hardness issues if close to the quarry sites.

The Templeton area to the east of the site is supplied by reticulated water from Christchurch City. The Christchurch public supplies are not at any risk from this proposal."[57]

271. The applicant has proposed a number of conditions which seek to monitor and mitigate the actual and potential adverse effects associated with depositing cleanfill into open excavations at the site. The mitigation measures proposed have been reviewed by both Mr Freeman and Dr Scott.

272. Dr Scott makes the following comments:

"The applicant has included lists of acceptable and unacceptable fill in their Draft Cleanfill Management Plan[58]*. Some other materials that I consider unsuitable, which are not included on the "unacceptable list" are roading materials containing coal tar, road-derived sediments (road sweepings and catchpit sediments), medium density fibreboard (MDF), uncured concrete, wet cement or any other liquid containing waste or slurries, such as hydro-excavated soils.*

Vegetative material is restricted to less than 3% per load. Such conditions are generally included to account for the difficulty in excluding all incidental vegetation from a load of soil. A high content of organic matter (e.g. vegetation), especially if buried deeper in the fill, is a risk to groundwater because the decomposition of organic compounds can create anoxic conditions which enhance the mobility of metal contaminants. I recommend that suitable fill should not contain any visible wood or plant matter.

Contaminants from stormwater can build up to high concentrations in the soils at the base of stormwater basins and they will require periodic replacement. Contaminated soil material with high levels of leachable contaminants from the basins should not be allowed as fill in the base of the quarry excavations."[59]

273. Mr Freeman notes the following:

"The MfE 2002 'A guide to the management of cleanfills' (MfE 2002) is currently New Zealand's only endorsed cleanfill management guideline. Section 4.2 of MfE 2002 defines materials which can enter cleanfills and Section 4.3 defines materials which cannot enter cleanfills.

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[57] Paragraphs 81, 82, 83 and 84 of Dr Scott's evidence.
[58] Roydon Quarry Draft Cleanfill Management Plan (Fulton Hogan, 8 March 2019)

[59] Paragraphs 107, 108 and 109 of Dr Scott's evidence.

Based on the CMP, the applicant has proposed to undertake Cleanfilling in the manner prescribed by MfE 2002. My only concern, with respect to the proposal is related to Section 5.3 of the CMP.

Under Section 5.3, the applicant indicates that if cleanfill is sourced from a site where a DSI has been undertaken and shows that the contaminants of concern are "at or below background concentrations" that material would be acceptable as cleanfill. It is my understanding that material going to cleanfill must meet "at or below background" for the receiving site and not the site of origin. This point should be clarified between the applicant, SDC and CRC."[60]

274. Given the sensitivity of the groundwater resource at the site as described by Dr Scott and Mr Freeman's advice, I consider the applicant should ensure cleanfill meets background concentrations for the receiving site and not the site of origin.

275. Based on advice from Dr Scott and Mr Freeman, I recommend the adoption of the following conditions which require the following:

    a. Expanding the list of unacceptable fill materials to include those set out by Dr Scott above; and

    b. Cleanfill to meet background concentrations at the applicant's site and not the site of origin.

276. In terms of Dr Scott's recommendation for fill to not include any visible vegetative matter, I note that the controlled activity criteria in Rule 5.177 of the CLWRP allows up to 3% in any cubic metre of material deposited and MfE Cleanfill Guidance provides no allowance for vegetative matter. I consider the adoption of no visible vegetative matter to be most appropriate to measure compliance and minimise adverse effects on groundwater quality.

277. On the basis of advice from Dr Scott and Mr Freeman and subject to careful compliance with the mitigation measures recommended above, I consider the actual and potential adverse effects on groundwater quality from the deposition of cleanfill are likely to be minor.

Actual and potential adverse effects on groundwater quality arising from the discharge of stormwater and other contaminants into land (excluding the discharge of contaminants arising from the deposition of cleanfill into land)

278. Stormwater (rainwater ponding on ground surface after rainfall events) can contain contaminants of concern which can pose a risk to groundwater quality. The applicant proposes to discharge both stormwater and aggregate washdown water at the site.

279. Stormwater may pond naturally within the deep excavation areas after rainfall events and may also enter excavated areas from the ground surface (as overflow). Suspended solids in stormwater runoff are identified by the applicant as being the only contaminant of concern.

280. The applicant considers the discharge of stormwater at the site will have no effect on groundwater quality at the site due to the only contaminant of concern in the discharge being sediment. A more thorough description of the sources and nature of discharges proposed at the site was provided as part of the first response to further information.

281. Dr Scott considers the main source of contaminated water would be stormwater from surfaces that carry vehicle traffic (roads and parking areas) and roof surfaces. Dr Scott considers the following in terms of potential contaminants in stormwater:

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[60] Paragraphs 50, 52 and 53 of Mr Freeman's evidence.

"Stormwater typically contains higher levels of contaminants in the first flush after a dry period, then generally low levels of metals, hydrocarbons and pathogens."[61]

282. In terms of nitrates, Dr Scott considers a small amount of fertiliser may be used at the site for revegetation and landscaping. But overall considers:

"higher concentrations of nitrates are likely to be discharged from the current grazed pasture and other farming activities on the site than the proposed land uses in the application."[62]

283. I agree with Dr Scott's description of the likely contaminants in stormwater at the site.

284. In the first further information response, the applicant provided the more detailed assessment of the nature and sources of stormwater runoff at the site. I consider this is generally consistent with the likely contaminants identified by Dr Scott.

285. The applicant proposes to discharge stormwater to land via dry ponds where stormwater will pond for no longer than 48 hours. The invert of the dry ponds are proposed to maintain 1 metre above highest seasonal groundwater level. Contaminant removal is proposed to be provided by a layer of soil lining the base of the storage pond. The applicant expects more than 75% of the hydrocarbon loading of the discharge will be removed as a result of the soil layer.[63] Further polishing of stormwater is expected to occur through at least one metre of unsaturated material.

286. Dr Scott's section 42A Report notes the following:

"I generally agree that the type of contaminants from these sources (sediment, metals, hydrocarbons, pathogens) are mostly able to be attenuated, provided the initial concentrations are low and there is enough filtration and adsorption capacity and slow enough travel times before the contaminants reach the groundwater."[64]

287. Dr Scott agrees with the applicant that some metals will likely be absorbed to silts that settle out in the ponds. However, Dr Scott highlights the uncertainly associated with the removal of pathogens from discharges:

"There is less certainty around the potential removal of pathogens from the discharges, particularly since the applicant's assessment has relied on overseas studies that are not necessarily relevant to Canterbury. Published data from Burnham and Templeton point to lower removal rates for coarse gravels[65]*. Using conservative removal rates, I calculated that the estimated bacterial loads indicated in the application (i.e. 4200 MPN/100 ml faecal coliforms), should be removed within less than 200 hundred metres from the source, if discharged at least one metre above the water table. Higher bacterial loads, for example in a heavy first flush event, would be less frequent, but could travel further from the site."*[66]

288. The applicant has not proposed a location for the ponds as they are intended to be moved as the quarry progresses. Dr Scott acknowledges this in her section 42A Report and highlights the following:

"Removal of contaminants to background levels before reaching any offsite wells will be more likely if the discharge points for stormwater and wash water can be located

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[61] Paragraph 55 of Dr Scott's evidence.
[62] Paragraph 67 of Dr Scott's evidence.
[63] In accordance with Ministry for the Environment On-site Stormwater Management Guidelines (NZWERF, 2004).
[64] Paragraph 60 of Dr Scott's evidence.
[65] Pang. L 2009: Microbial removal rates in subsurface media estimated from published studies of field experiments and large intact soil cores, J. Environ Qual. 38:1531 – 1559.
[66] Paragraph 61 of Dr Scott's evidence.

on the upgradient side of the site and above a thick unsaturated zone (i.e. at the original ground level).”[67]

289. At the time of preparing this report, the applicant still maintains their existing proposal and considers monitoring of groundwater quality (audited in detail below) and other areas downgradient of the site will detect any changes in groundwater quality and inform mitigation measures that will be implemented.

290. On the basis of advice provided by Dr Scott, I consider the discharge of stormwater and aggregate wash water at the site could have an effect on groundwater quality and users that is minor.

Actual and potential adverse effects on groundwater quality arising from site remediation at the conclusion of cleanfilling and future land use

291. Excavation and deposition proposed at the site will remove topsoil over large areas and remove up to 9.9 metres of unsaturated zone above groundwater. The applicant does not propose to deposit cleanfill to fill the excavated quarry pit to original ground level at the site, rather proposes at a minimum to re-spread topsoil to a depth of 300 millimetres. This results in a finished floor level of 1.3 metres above highest groundwater level, removing a large portion of natural protection for the groundwater system against microbial, heavy metal and hydrocarbon contaminants.

292. Several submissions identified this topic as a concern. A submission made by the Yaldhurst Residents Association identifies concern with regards to post quarry land use and suggests requiring a bond from the applicant to ensure the company adheres to agreed conditions (if consents are granted).

293. The applicant proposes to progressively rehabilitate the site as excavated areas are exhausted. All site rehabilitation is proposed to be undertaken in accordance with a Quarry Rehabilitation Plan.[68] The Quarry Rehabilitation Plan sets out the objectives and procedures proposed to rehabilitate the site. At a minimum, the applicant proposes to re-spread topsoil and other overburden materials to a minimum depth of 300 millimetres, stabilise battered slopes and grass or plant other vegetation to create a stable and free draining landform.

294. The applicant indicates throughout the application that the availability of appropriate cleanfill is likely to be variable over the duration of the resource consents (if granted). If appropriate cleanfill is unable to be sourced, the applicant proposes to undertake the minimum requirements for rehabilitation as described above, this will result in a final landform with a separation of 1.3 metres to seasonal highest groundwater.

295. The applicant does not propose a post-quarry land use as part of their application. Instead the applicant highlights the potential provided by the site to be an exemplar for site rehabilitation. It is concluded that dairying is unlikely to be a feasible future site use given the high risk to groundwater quality due to the leaching of nitrates and other factors which result in this option being uneconomical for the applicant. The further information response considers the most likely site use, based on the current planning framework, would be lifestyle blocks with accompanying small animal rearing (including sheep, goats and pigs) and possibly horticultural activities via glass houses.

296. Dr Scott considers the excavation proposed at the site will:

“markedly reduce the thickness of the unsaturated zone above the water table and will change the vulnerability of the underlying groundwater to contamination.

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[67] Paragraph 62 of Dr Scott’s evidence.

[68] A draft version of the Quarry Rehabilitation Plan was provided as Appendix G of the original application.

A thick layer of topsoil and an unsaturated zone of several metres above the groundwater can have beneficial effects in removing some types of contaminants. Metals and hydrocarbons are attenuated by adsorption on mineral coatings and organic matter in the soil and sediments. Microbial pathogens are filtered out, adsorbed, predated or desiccated and die-off if they travel through a thick unsaturated zone before reaching groundwater[69]."[70]

297. Dr Scott concludes that the activities over the modified landform could pose a greater risk to groundwater quality than the surrounding land uses which occur over unmodified ground.

298. I consider rehabilitation and ongoing land use are two related but separate issues that require consideration. In my view, rehabilitation of the site can be addressed through the implementation of conditions specifying minimum standards across the site. The future land use of the site is of significant importance beyond both the life of the consent and the activities proposed.

299. In terms of site rehabilitation, I have recommended conditions which require staged rehabilitation of the site after quarrying, including the application of a minimum 300 millimetre thick layer of topsoil. Inclusion of such a condition is supported by Dr Scott in her evidence. I have also recommended conditions requiring the following:

    a. Staged rehabilitation be undertaken in accordance with a Quarry Rehabilitation Plan;

    b. Rehabilitated areas be reshaped and free draining; and

    c. Rehabilitated areas be sown with grass species or another suitable species.

300. Section 108(2)(b) of the RMA allows a consent condition to require a bond to be entered into with the consent authority. Section 108A specifies that a bond may be required to ensure the performance of one or more conditions of a resource consent and it may continue to be in force after the expiry of the consent to ensure the ongoing performance of conditions relating to long-term effects. On the basis of advice from Dr Scott, I consider the potential long-term effects on groundwater quality arising from the applicant's proposal warrants the inclusion of a bond to be entered into to ensure, at the conclusion of works or if works unexpectedly cease, the site can be remediated and potential effects on groundwater can be minimised long term. In the first response to further information the applicant indicated their willingness to discuss a bond for site rehabilitation.

301. While the remediation procedures listed above will assist in addressing the potential effects on groundwater quality post-quarrying, I consider it appropriate that additional measures are utilised to protect groundwater quality long-term. I consider it appropriate for the consent holder to enter into a bond with the CRC, the intent of such a condition is to provide CRC with necessary funds to fully remediate the site in the event the applicant defaults or abandons the site.

302. The applicant was also requested to provide information on whether a covenant relating to ongoing landuse would be considered, the applicant did not note their willingness to discuss covenants, rather acknowledging the concern around the nature of future land uses at a reduced ground level and identifying that they would be limited given the site constraints.

303. Dr Scott considers:

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[69] Pang, L 2009: Microbial removal rates in subsurface media estimated from published studies of field experiments and large intact soil cores, *J. Environ. Qual*. 38:1531–1559.

[70] Paragraphs 46 and 47 of Dr Scott's evidence.

"Activities over this modified landform could pose a greater risk to groundwater quality than the surrounding land uses which occur over unmodified ground. High loading of bacterial contamination (e.g. intensive grazing or effluent discharges) and high volumes of water applied (inefficient irrigation) over rehabilitated fill, especially fill with the separation to groundwater decreased, could lead to greater risks of groundwater contamination after the site is closed. I recommend that these effects are taken into consideration in rehabilitation and post-closure plans and consent conditions."[71]

304. I agree with Dr Scott and consider the following activities should be avoided at the site:

    a. Intensively farmed stock (defined by the CLWRP as cattle or deer grazed on irrigated land or contained for break-feeding of winter feed crops, dairy cattle, including cows, whether dry or milking, and whether on irrigated land or not; or farmed pigs); and

    b. Wastewater discharges (application of effluent)

305. To restrict these activities from occurring, I consider a covenant listed on all land titles associated with the site to exclude high intensity land uses that may cause effect on groundwater quality, as listed above, is essential. As covenants are associated with the land they apply to, the restrictions on future land use will bind future landowners in perpetuity. Therefore, future plan changes to the LWRP would not need to include provisions to address the effects of such activities occurring on the site.

306. If conditions requiring a bond or covenant are not applied as part of the consents (if granted) I consider there is a risk that the potential adverse effects on groundwater quality may be more than minor. If excavation or deposition of material ceases and the applicant is unable to complete the remediation proposed, the unremediated quarry pit floor will not provide adequate separation to groundwater to minimise the risks of future land uses. If a covenant is not applied, I consider there is potential for future land use activities which could result in unacceptable risk to groundwater long term. As such, I recommend conditions requiring both a bond and a covenant be placed on all land titles should the consents be granted.

Actual and potential adverse effects on public water supplies (M36/7575)

307. The excavation of material, deposition of cleanfill, discharges and operation of the site has the potential to cause adverse effects on public water supplies.

308. As set out in the earlier sections of this assessment, the area of Templeton is supplied by reticulated water from Christchurch City Council and there is no risk to CCC public water supplies as a result of this proposal.

309. Within the 1 kilometre down-gradient area there is one public supply well (M36/7575) owned and operated by SDC. SDC use this well to supply the Devine Drive area (Source G01673, Claremont Bore). A submission made by SDC indicates concern regarding the actual and potential effects on this community supply well. A key concern highlighted by SDC is the proposed activities occurring close to groundwater levels in the area and the potential for any contaminants to enter groundwater and effect M36/7575.

310. To assess the actual and potential adverse effects on public water supply, Dr Scott has focused her assessment on M36/7575. Dr Scott makes the following comments:

[71] Paragraph 51 of Dr Scott's evidence.

"The well is 600 m directly downgradient from the closest point on the Roydon Quarry property and the water supply is untreated but is regularly tested for the presence of bacteria[72]*.*

The well is 108 m deep with screens from 105 m below surface. Age tracer data was collected for the well in 2006 and 2010, showing the mean recharge age of the groundwater is greater than 80 years, although some gas tracers (CFCs and SF_6) indicate younger water ages from 20 years old in the 2010 results. The bore supply is considered by Selwyn District Council to be secure. The discharges from proposed activities should not be a significant source of either E. coli or nitrate nitrogen, the two contaminants of highest concern for a public water supply. Typical contaminants from the quarry site, such as metals or hydrocarbons are highly unlikely to persist or migrate over the time and distance it takes for groundwater to reach the deep supply well. In my opinion, the potential for contamination of this well from the proposed activities is very low."[73]

311. If regular testing of the water from M36/7575 does indicate an increase in bacteria once the proposed quarry becomes operational, Dr Scott considers:

"it would be reasonable to investigate any potential links to the quarry and require any sources of faecal contamination, if found, to be removed."

312. As audited in detail below, the applicant has proposed to undertake regular monitoring of groundwater quality. The intent of groundwater quality sampling is to identify any adverse effects on groundwater quality within the site prior to potential effects on the quality of groundwater supplies offsite. There are some changes to the applicant's proposed sampling regime recommended by Dr Scott to increase the rigour of monitoring and improve the protection of wells used for domestic water supply. Given the distance to well M36/7575, I consider any contamination from the site would likely be identified in the applicant's groundwater monitoring or nearby private wells, prior to M36/7575. Overall, Dr Scott concludes that:

"The risk to the public supply from the Selwyn District Council Claremont bore is very low."[74]

313. Based on the advice of Dr Scott, I consider there is no requirement for targeted mitigation of the effects for well M36/7575. Given this, I consider the actual and potential adverse effects on community supply well M36/7575 is less than minor.

Ongoing monitoring of groundwater quality

314. In addition to undertaking groundwater level monitoring to maintain 1 metre separation to groundwater, the applicant proposes to undertake groundwater quality monitoring on a regular basis for the duration of the resource consent. The applicant proposes a groundwater quality monitoring protocol, contaminant trigger concentrations and actions to be undertaken in the event samples exceed groundwater triggers.

315. If an exceedance in groundwater trigger levels is identified, the applicant proposes the following protocol:

    a. Notify all residential occupiers of adjoining properties to the south and south-east of the cleanfill site with water supply bores; and

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[72] Selwyn District Council website: https://www.selwyn.govt.nz/services/water/water-supplies/water-schemes-under-chlorination/water-quality-in-selwyn-district/water-quality-tests-results

[73] Paragraphs 86 and 87 of Dr Scott's evidence.

[74] Paragraph 130 of Dr Scott's evidence.

b. Implement necessary measures to reduce the concentration of the contaminant in groundwater. Such measures include:

   i. Cessation of activities that cause the exceedance;

   ii. Removal of contaminant source;

   iii. Stabilisation or capping of contaminant source; and

   iv. Revision of cleanfill procedures.

316. The applicant has already installed four monitoring bores[75] at the site, Dr Scott considers the bores are appropriate for taking groundwater samples of the water table, where any effects would be most evident. In terms of monitoring frequency, Dr Scott recommends the applicant increase their sampling frequency to quarterly for at least the first five years of operation at the site then reduce to six-monthly to track longer term effects from the reaction of the fill.

317. In terms of monitoring bores, Dr Scott recommends the following:

"I recommend that the onsite shallow domestic well, M36/2743, be added to the water sampling programme because this is the drinking-water well most likely to be affected by the proposed activities."[76]

318. I agree with the recommendation made by Dr Scott and have recommended that the conditions also require the sampling of M36/2743 (so long as it remains in use).

319. Trigger values proposed are largely based on the Maximum Acceptable Values (MAV) and Guideline Values (GV) in the New Zealand Drinking Water Standards and are consistent with the 50% MAV limits for groundwater in the Selwyn Te Waihora Zone set out in Table 11(m) of the LWRP. Dr Scott supports the use of these triggers and notes that only minor changes to these trigger values are suggested. At a high level this includes:

   a. Removing acidity and nitrate nitrogen from the list of monitoring parameters;

   b. Increase the trigger value for alkalinity from 50g/m³ to 100g/m³ due to elevated background concentrations;

   c. Amending the trigger values for aesthetic significance to align with the Drinking Water Standards of New Zealand values; and

   d. Amending triggers for dissolved parameters of health significance to a value of half the Maximum Acceptable Value. The *E.coli* trigger of <1 MPN per 100ml should be applied as a median value over the duration of monitoring for each bore, rather than a trigger for each sample.

320. Dr Scott agrees with the applicant's proposal to undertake confirmation sampling if a trigger value is exceeded in an initial sample. The conditions as proposed, would allow a confirmation sample to be undertaken at any stage after the initial sample showed an exceedance. Dr Scott considers a confirmation sample should be taken within one month of the initial sample that showed an exceedance. I agree and have recommended amendments to the applicant's proposed conditions to reflect this.

321. Dr Scott also recommends that an exceedance of any health-related triggers in a downgradient monitoring bore should also require sampling of any potentially affected domestic wells near the monitoring bore. If a private well is found to also breach the same health-based trigger, immediate provision of an appropriate

[75] BX23/0833 and BX23/0836 upgradient and BX23/0834 and BX23/0835 downgradient.
[76] Paragraph 116 of Dr Scott's evidence.

treatment system or alternate water supply should be required. I agree and have recommended a condition to this effect.

Summary

322. In terms of excavation, subject to careful compliance with maximum excavation depths, implementation of measures to reduce the likelihood of spills and leaks and prompt attendance to spills or leaks if they were to occur, I consider the actual and potential adverse effects on groundwater quality are able to be adequately mitigated.

323. The activities which represents the greatest risk to groundwater quality are the deposition of cleanfill material, rehabilitation of the site and future site use. Dr Scott confirms in her report that the deposition of material has the potential to cause some degradation in aesthetic properties of groundwater (e.g: taste and hardness), however this is likely to be of low impact and dissipate within a few hundred metres of the site.

324. In accordance with advice from Mr Freeman, I have recommended conditions requiring the applicant to undertake their cleanfilling operation in accordance with MfE (2002) Guidelines. With regards to remediation and future site use, I have recommended conditions to require a bond be entered into with CRC for remediation and covenant to be placed on all land titles associated with the site to exclude activities with a high contaminant leaching potential from occurring at the site. Without such measures being imposed, I consider there could be significant risk to groundwater quality and users in future.

325. Dr Scott has confirmed that there is very low potential for public supply well M36/7575 owned by SDC to be contaminated as a result of the activities proposed. Given this, I do not consider targeted mitigation measures for this well to be necessary.

326. The applicant has proposed to undertake ongoing groundwater monitoring at the site, based on the advice from Dr Scott, I have recommended some amendments to contaminant parameters and sampling regime. I have also recommended the applicant sample onsite well M36/2743, so long as it remains in use. In response to advice from Dr Scott, I have also recommended conditions requiring the applicant undertake sampling of nearby private wells, if monitoring wells indicate exceedances of parameters for health significance. If the private wells sampled also show exceedances of parameters of health significance the applicant is required to provide treatment of the water or provide an alternative water source for the private well owners.

327. Overall, I consider the actual and potential adverse effects on groundwater quality and users are able to be mitigated to a high degree, resulting in a minor effect on groundwater quality and users.

Actual and potential adverse effects on groundwater quantity and water levels in nearby wells

328. The abstraction of groundwater creates a drawdown cone that extends laterally from the pumping well, which may result in a lowering of groundwater levels in neighbouring wells. The site is within the Selwyn-Waimakariri Groundwater Allocation Zone, which is currently overallocated. Any application to take and use new water in this zone is unable to meet the allocation limit in Table 11(e) of the CLWRP and as a result would be a prohibited activity, meaning resource consent could not be sought for the take and use of any additional water in this zone. Given that the zone is over-allocated, any additional taking of water could result in cumulative adverse effects on groundwater levels.

329. This summary of the actual and potential adverse effects on groundwater quantity and water levels in nearby wells should be read in conjunction with the memorandum from Mr Just.[77]

330. Some submissions received raised concerns regarding the potential effects on groundwater quantity and water levels in nearby wells as a result of the applicant's proposal to use water for dust suppression and aggregate washing.

331. The applicant proposes to utilise the volume of water authorised under an existing water permit (CRC182422) for dust suppression, aggregate washing and other ancillary uses in addition to irrigation which is already authorised by the existing water permit. There is no proposed increase in rate or volume sought for the take authorised by CRC182422.

332. The existing water permit does not include an annual volume limit. It is important that the annual volume limit assigned to the existing water permit, and associated use consent, if granted, accurately reflects the scope of the existing consent to ensure that no additional water is taken.

333. In accordance with CLWRP policies 4.63 and 4.64, the applicant was requested to provide an annual volume for the water permit, calculated in accordance with Schedule 10 of the CLWRP. The methodology to calculate the annual volume needs to be applied to the existing water permit so it does not allow any additional water to be taken.

334. In the second response to further information the applicant calculated their annual volume to be 365,622 m³ in accordance with method 3 set out in Schedule 10 of the CWLRP. Mr Just has reviewed the applicant's calculations and annual volume proposed. Mr Just considers the applicant has made two key errors in determining the annual volume for abstraction authorised by CRC182422. Further details relating to the two errors are set out in Mr Just's memorandum. Mr Just concludes:

"In summary, I am of the view that applying method 3 of Schedule 10 of the LWRP determines that an annual volume of 96,489 m³ is appropriate for the irrigation authorised under CRC182422. If an additional use consent is to be granted for quarrying purposes, this annual volume limit should apply to ensure that no additional water is taken from that currently authorised."[78]

335. Based on Mr Just's comments and calculations, I consider the correct annual volume in accordance with method 3 of Schedule 10 is 96,489m³.

336. Overall, as the applicant is not proposing to take any additional water beyond that which is already authorised via CRC182422, the adverse effects on groundwater quantity are no greater than what is currently authorised and there will be no additional effect on the availability of water in neighbouring wells, if the recommended annual volume limit of 96,489m³ is included as a consent condition of both the existing water permit, and any new use permit, if granted.

337. The termination of SDC water races to soakage at the site could result in localised elevation of the groundwater table (mounding) and recharge of groundwater around soakage points, contributing to groundwater quantity.

338. The applicant proposes to take and use water from the SDC water races that would usually terminate via soakage to land to supplement water taken and used from well M36/0257. Dr Scott considers it is unlikely there would be significant changes in the amount of recharge to groundwater by removing the soakage to land aspect

[77] Appended as Appendix 6.
[78] Page 3 of Mr Just's memorandum.

proposed by the applicant. Given this, I consider the potential adverse effects on groundwater from this activity to be less than minor.

339. Dr Scott does not consider there will be any changes to groundwater flow patterns around the site as the applicant does not propose to excavate the groundwater table at any time

Actual and potential adverse effects on soil resources

340. The demand for aggregate in Canterbury has increased significantly as a result of the recovery and rebuilding activities resulting from the Canterbury Earthquake Sequence of 2010 and 2011. As the rivers in the Canterbury Region have a limited amount of aggregate available for extraction and use, land-based quarrying is now a common occurrence in the rural hinterland of Christchurch City. It is acknowledged that while using the site for quarrying will temporarily remove the site from productive uses, rehabilitation will also return the site to a pastoral state following completion.

341. I consider the actual and potential adverse effects on soil resources could arise from the following soil contamination as a result of spills or leaks of hydrocarbons or other contaminants.

342. The applicant considers the proposal will not have an adverse effect on soil quality for the following reasons:

    a. Machinery will be well maintained to limit the potential for any hydraulic fluid spills;

    b. A spill management plan be developed at the site;

    c. Staff will be trained and spill kits available to manage any hydraulic oil or fuel leak;

    d. Topsoil and subsoil material will be removed prior to excavation and will be stored in onsite bunds to prevent degradation and erosion losses, prior to being used in site rehabilitation; and

    e. If additional soil is required to remediate the site, imported soil will accord with the definition of cleanfill.

343. I consider the storage of hazardous substances could result in adverse effects on soil quality, if hazardous substances are not stored appropriately. The applicant has proposed to store hazardous substances at the site in accordance with the relevant permitted activity criteria in the CLWRP. As set out in the assessment of actual and potential adverse effects on groundwater quality and users, I have recommended conditions requiring the development and implementation of a spill management plan for the site and for machinery to be well maintained.

344. I also consider the applicant is proposing to store topsoil and sub-soils in an appropriate manner. The applicant has also proposed to vegetate bunds to reduce erosion losses in the long term. Conditions have been recommended to this effect and require the vegetation to be maintained in a healthy state.

345. Subject to compliance with the conditions as recommended, I consider the actual and potential adverse effects on soil resources are likely to be less than minor.

Actual and potential adverse effects arising from contaminated land

346. The site preparation activities proposed have the potential to mobilise existing soil contamination. In assessing this aspect of the proposal, I have relied on the advice from Mr Freeman, CRC Principal Science Advisor for Contaminated Land.

347. 107 Dawsons Road and 220 Jones Road (both located within the site) were identified on CRC's Listed Land Use Register (LLUR) as potentially contaminated sites due to use as a 'livestock dip or spray race operation'. The applicant provided Preliminary and Detailed Site Investigations which were reviewed by Mr Freeman.

348. Mr Freeman confirms the former stockyard located at 220 Jones Road is no longer an area of interest with respect to contaminated land, but notes there are some areas of 107 Dawsons Road which are yet to be characterised and remediated. The applicant proposes to remediate contaminated land in accordance with a Remedial Action Plan. Mr Freeman considers:

"The applicant has indicated that they will use a remedial action plan (RAP) to guide their approach to remediating contaminated material at the site (proposed conditions 46-51, August 2019 s92 response). I agree that a RAP should be prepared and submitted; however, the applicant does not appear to have given a timeframe for submitting the RAP.

The applicant has only identified SDC as recipient of the RAP (proposed condition 46). CRC should also be provided with a copy of the document for review, since contaminants of concern in materials being handled during remediation may pose risk to the groundwater resource from stormwater ingress and discharge to ground.

CRC should provide input to the RAP to ensure proper storage and management of any contaminated or potentially contaminated stockpiles; material sorting piles; and remediation excavations. The terms relating to the remediation of contaminated material are otherwise acceptable."[79]

349. Overall, subject to the potentially contaminated areas of 107 Dawsons Road being characterised appropriately and addressed as required by the DSI, the risk to the environment is low.

350. I agree with the conclusions made by Mr Freeman and have recommended conditions are included requiring all remediation works to be undertaken in accordance with a RAP and the RAP be submitted to CRC prior to remediation works being undertaken.

351. In terms of human health, it is the NESCS which assess the risk of undertaking earthworks at a contaminated site. For an analysis of this aspect I defer to the report of Mr Henderson given that the NESCS is a District Council matter.

352. The potential adverse effects on the groundwater resource arising from the removal of contaminated soil or receiving contaminated waste is assessed in the earlier sections of this report

353. Overall, subject to compliance with the recommended conditions, I consider the actual and potential adverse effects arising from the remediation of contaminated land are less than minor.

Actual and potential adverse effects on Ngāi Tahu cultural values

354. The activities proposed by the applicant have the potential to adversely affect Ngāi Tahu cultural values by disturbing culturally significant areas or affecting the mauri of water. Air can also be described as both a taonga and part of the traditional Kaitiakitanga for Māori.

355. A neutral submission was received from Te Taumutu Rūnanga regarding the proposal. They do not wish to be heard at the hearing.

[79] Paragraphs 46, 47 and 48 of Mr Freeman's evidence.

356. The applicant states there are no known waahi tapu sites or other sites of significance to Ngāi Tahu on the site. Further, there are no proposed discharges to water, no disturbance of significant indigenous flora or fauna and no identified areas of ecological significance on the site. The applicant highlights that they accept a condition which sets out the accidental discovery protocol to be undertaken in the event Koiwi Tangata or taonga are unearthed. Given this, the applicant considers the proposal will not have any potential adverse effects on cultural values.

357. Section 6.10 of the application notes that the applicant has discussed their proposal with Mahaanui Kurataiao (MKT) and have determined that a Cultural Impact Assessment is not necessary for this proposal.

358. In assessing the actual and potential adverse effects on Ngāi Tahu cultural values I have reviewed the relevant policies of the Mahaanui Iwi Management Plan (MIMP). The MIMP sets out the policy framework to achieve outcomes that provide for the relationship between Ngāi Tahu and natural resources.

359. The applicant has provided an assessment of the MIMP in Section 4.6.3.6.2 of the application. I have audited the applicant's assessment and generally agree with the conclusions made. I have provided an assessment on the key policies in the sections below:

    a. *R1.1 seeks the mauri of air are protected from adverse effects associated with the discharge to air activities.*

    b. *P6.1 requires on-site solutions to stormwater management in all new urban, commercial, industrial and rural developments.*

    c. *P8.1 requires that discharge to land activities in the takiwā:*

        i. *Are appropriate to the soil type and slope, and the assimilative capacity of the land on which the discharge activity occurs;*

        ii. *Avoid the over-saturation and therefore the contamination of soil, and/or runoff and leaching; and*

        iii. *Are accompanied by regular testing and monitoring of one or all of the following: soil foliage, groundwater and surface water in the area.*

    d. *P11.6 To avoid damage or modification to wāhi tapu or other sites of significant as opposed to remedy or mitigate.*

    e. *Policy P13.3 requires all applications for mining and quarrying activities to include:*

        i. *Quarry Management Plans for earthworks, erosion and sediment control, waterway protection, on site stormwater treatment and disposal and provisions for visual screening/barriers that include indigenous vegetation; and*

        ii. *Site rehabilitation plans that include restoration of the site using indigenous species.*

360. The proposed excavation area is not within a Silent File or Statutory Acknowledgement Area and my audit of the site and surrounds did not identify any sites of cultural significance. The applicant has proposed an accidental discovery protocol to be included as a consent conditions in the event anything of archaeological significance is encountered. In response to Policy P13.3, the applicant proposes to undertake their activity with a number of management plans including:

    a. Rehabilitation Management Plan;

b. Dust Management Plan;

c. Cleanfill Management Plan; and

d. Spill Management Plan.

The content of the management plans listed above is broad and includes matters relating to mitigation listed in Policy 13.3. In terms of clause (b), at this stage it is unknown what the future site use will be.

361. The implementation of an accidental discovery protocol and spill management plan is consistent with the relief sought by Te Taumutu Rūnanga in their submission. Te Taumutu Rūnanga also sought the separation to highest groundwater at the site should be raised to 1.3 metres due to the increase in groundwater levels that may be experienced as a result of the Central Plains Water Scheme. Several submitters raised this as a potential concern which is discussed in the 'Actual and potential adverse effects on groundwater quality arising from excavation of aggregate' section of this report.

362. Given the provision of an accidental discovery condition and proposed mitigation and management to reduce actual and potential adverse effects on groundwater quality and users, I consider the applicant is proposing to undertake their operation in a manner that is consistent with the outcomes sought in the MIMP.

Positive Effects

363. In accordance with section 104(1)(a) of the RMA, when considering a resource consent, the consent authority must consider any actual and potential environmental effects of allowing the activity, this includes positive effects. The applicant considers the following positive effects are likely to occur as a result of undertaking their proposal:

a. Approximately 10 million tonnes of aggregate is expected to be extracted and processed at the site which will contribute to the 45 million tonne aggregate shortfall predicted for Christchurch City for the period 2014 to 2041.

b. The site would also accept quantities of cleanfill which are projected by Fulton Hogan to average around 100,000 to 200,000 tonnes per annum.

c. Many aggregate quarries in the hinterland of Christchurch City are nearing exhaustion. Providing a supply of aggregate close to the areas of greatest demand reduces economic, environmental and social costs that would be increased should new quarries have to be established at greater distances.

d. The proposed activity will also continue to generate direct employment for on-site staff and indirect employment for numerous other workers within the construction and roading industries, including truck drivers, administrative staff and contractors.

e. Overall, the applicant considers the proposal promotes community economic wellbeing and efficient use and development of resources.

364. I agree with the applicant that the positive effects listed are likely as a result of undertaking the applicant's proposal.

ADDITIONAL CONCERNS ARISING FROM SUBMISSIONS

365. Many submissions received raised issues that were unable to be categorised into the assessment of actual and potential adverse effects undertaken above. I have provided an assessment of such concerns in the sections below.

366. Several submissions raised concerns regarding the applicant's compliance with consent conditions (if consents are granted) and CRC's ability to monitor compliance with consent conditions. It is acknowledged that CRC Compliance and Monitoring staff are unable to be at the quarry site at all times and due to the distance between CRC's offices and the proposed quarry site, are unable to respond to complaints immediately. In recommending conditions and providing comments for recommended conditions, I have focused on ensuring mitigation measures recommended are as autonomous as possible (e.g: text alerts to staff if PM_{10} triggers are breached) reducing the reliance on neighbours to alert CRC to dust issues.

367. If consents are granted and it is discovered there are adverse effects that arise from the exercise of the consent, the RMA allows CRC to serve notice on the consent holder of its intention to review the conditions of the resource consent.[80]

368. Mr Firth has prepared a memorandum[81] summarising the findings of the Yaldhurst Air Quality Monitoring Program (YAQM) referred to in Ms Ryan's evidence. The intent of the monitoring program was to gather sufficient data to determine if levels of dust and RCS from quarrying activities poses a long-term health risk to residents. Results of the program showed no serious public health risk to residents from airborne dust, but did find that new tougher quarry dust management and monitoring requirements were necessary. As a result all quarries within 500 metres of a dwelling in the Yaldhurst area were required to install continuous dust monitors and comply with a cease works trigger for PM_{10} of 150 $\mu g/m^3$ as a 1-hour average.

369. Some submissions also sought that if resource consents are granted and subsequent variations to conditions are lodged in future, the applications to vary conditions are publicly notified. The RMA allows consent holders to apply for a change or cancellation of a condition in the future[82]. I am unable to predict what conditions the applicant might wish to change in the future and cannot predetermine any decisions on a future application. Similarly, the consent authority is unable to require future applications to be notified, the decision on whether to notify the applications or not needs to be made at the time the application is lodged, in accordance with the relevant provisions of the RMA.[83]

370. Submissions also sought the assessment of effects on property values and the ability to sell property. There is no ability under the RMA to consider such effects.

COMPLIANCE HISTORY

371. The applicant holds several consents to undertake activities associated with quarrying in the Canterbury region. CRC holds compliance information relating to resource consents held, CRC also maintains a register of complaints. According to this register CRC have received 15 complaints related to the applicant's existing operations at Miners Road and Pound Road within a four year period between 2014 and 2018.

372. CRC compliance monitoring staff provided me with compliance monitoring reports for the applicant, focussing on the main consents for the Pound and Miners Road quarries, given the applicant holds a large number of consents. The compliance reports provided were for the land use and discharge consents, air permits, and water permits associated with quarrying activities at these sites. Based on these compliance monitoring reports, the applicant has been largely compliant with their

[80] In accordance with section 128.
[81] Appended as Appendix 5.
[82] In accordance with section 127.
[83] In accordance with sections 95A-95E.

main consents at the two quarries. Some non-compliance has been noted, and this appears to be largely related to water metering requirements (such as data loggers not working continuously) and an exceedance of the consented rate and volume of water taken.

OBJECTIVES AND POLICIES

373. The applicant has provided a comprehensive review of the relevant objectives and policies related to this activity within the application (Appendix K, Statutory Assessment).

374. Section 104(1)(b) of the RMA states the following:

> *"(1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to– …*
>
> *(b) any relevant provisions of—*
> *(i) a national environmental standard:*
> *(ii) other regulations:*
> *(iii) a national policy statement:*
> *(iv) a New Zealand coastal policy statement:*
> *(v) a regional policy statement or proposed regional policy statement:*
> *(vi) a plan or proposed plan; …"*

375. In accordance Section 104(1)(b) of the RMA, the relevant National Environmental Standards, National Policy Statements, Regional Policy Statement and Regional Plans are assessed below.

National Policy Statement for Freshwater Management 2014 (amended 2017) (NPSFM)

376. Section 104(1)(b)(iii) of the RMA states that the consent authority shall have regard to the relevant provisions of a National Policy Statement. Of relevance to this application is the NPSFM

377. The NPSFM took effect on 1 July 2011 and amendments were made in 2014 and 2017. The NPSFM sets out the objectives and policies which direct regional councils to manage water in an integrated and sustainable way, while providing for economic growth within set water quantity and water quality limits.

378. The applicant has provided an assessment of the proposal against the NPSFM and considers the proposal is consistent with the NPSFM. The relevant objectives and policies of the NPSFM are assessed below:

379. Objectives A1, A2 and A4 relate to water quality issues. **Objective A1** states:

> *"To safeguard:*
>
> *a) the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and*
>
> *b) the health of people and communities, as affected by contact with fresh water;*
>
> *in sustainably managing the use and development of land, and of discharges of contaminants."*

380. **Objective A2** states:

> *"The overall quality of fresh water within a freshwater management unit is maintained or improved while:*

a) *protecting the significant values of outstanding freshwater bodies;*

b) *protecting the significant values of wetlands; and*

c) *improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated."*

381. **Objective A4** states:

"To enable communities to provide for their economic well-being, including productive economic opportunities, in sustainably managing freshwater quality, within limits."

382. Policy A3 provides the way in which Objectives A1, A2 and A4 will be achieved. **Policy A3** states:

"By regional councils:

a) *imposing conditions on discharge permits to ensure the limits and targets specified pursuant to Policy A1 and Policy A2 can be met; and*

b) *where permissible, making rules requiring the adoption of the best practicable option to prevent or minimise any actual or likely adverse effect on the environment of any discharge of a contaminant into fresh water, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water."*

383. **Policy A4** states:

1. *"When considering any application for a discharge the consent authority must have regard to the following matters:*

   a) *the extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of fresh water including on any ecosystem associated with fresh water;and*

   b) *the extent to which it is feasible and dependable that any more than minor adverse effect on fresh water, and on any ecosystem associated with fresh water, resulting from the discharge would be avoided.*

2. *When considering any application for a discharge the consent authority must have regard to the following matters:*

   a) *the extent to which the discharge would avoid contamination that will have an adverse effect on the health of people and communities as affected by their contact with fresh water; and*

   b) *the extent to which it is feasible and dependable that any more than minor adverse effect on the health of people and communities as affected by their contact with fresh water resulting from the discharge would be avoided.*

3. *This policy applies to the following discharges (including a diffuse discharge by any person or animal):*

   a) *a new discharge or*

   b) *a change or increase in any discharge – of any contaminant into fresh water, or onto 14 or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water."*

384. The applicant considers the proposed activity will not adversely impact on the groundwater resource underlying the site and the material deposited will be cleanfill

and will be placed at least 1 metre above highest recorded groundwater levels. Therefore, the underlying groundwater resource will not be adversely affected, the health of people and the community will be safeguarded, and the quality of groundwater will at least be maintained.

385. Based on the advice of Dr Scott, during excavation and filling I consider Objective A1 A2 and A4 will be achieved and the overall quality of freshwater within the freshwater management unit will be maintained while achieving sub-objectives (a) to (c) of Objective A2. As highlighted by Dr Scott, activities over the modified land form post-quarrying could pose greater risk to groundwater quality than surrounding land uses. To minimise this risk and ensure groundwater quality is maintained at the site long term, I have recommended the adoption of a bond and covenant be applied as consent conditions (in the event the application is granted). If a covenant is not applied, then I consider groundwater quality at the site may not be maintained or improved as required by the NPSFM.

386. In accordance with Policy A3(a) and with input from Dr Scott, I have recommended a suite of groundwater monitoring conditions and associated trigger levels. Groundwater trigger levels are largely based on the Maximum Acceptable Values (MAV) and Guideline Values (GV) in the New Zealand Drinking Water Standards and are consistent with 50% MAV limits for groundwater in the Selwyn Te Waihora set out in Table 11(m) of the CLWRP.

387. In accordance with subsection (3)(a) of Policy A4, a new discharge forms part of the proposal made by the applicant therefore subsections (1)(a), (1)(b), (2)(a) and (2)(b) of Policy A4 are relevant for assessment. I have had regard to the matters set out in subsections (1)(a) and (2)(a), based on the advice from Dr Scott, I do not consider the discharges to land that may enter groundwater proposed will have an adverse effect on the life-supporting capacity of freshwater, nor do I consider the discharge will have an adverse effect on the health of people and communities as affected by their contact with freshwater. I have had regard to matters (1)(b) and (2)(b), based on the advice from Dr Scott, do not consider the discharges proposed are likely to result in an adverse effect that is more than minor.

388. Objective B1 and Policy B5 relate to water quantity issues. **Objective B1** states:

"To safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water, in sustainably managing the taking, using, damming, or diverting of fresh water."

389. **Policy B5** states:

"By every regional council ensuring that no decision will likely result in future over-allocation – including managing fresh water so that the aggregate of all amounts of fresh water in a freshwater management unit that are authorised to be taken, used, dammed or diverted does not over-allocate the water in the freshwater management unit."

390. The applicant provided an assessment of the relevant NPSFM policies on the basis of a change of conditions to the applicant's exciting water permit. An updated analysis of the relevant NPSFM objectives and policies did not form part of the responses to further information provided from the applicant.

391. As the applicant is not proposing to increase the total volume of water already allocated under the existing permit, I do not consider the application will contribute to future overallocation, which accords with Objective B1 and Policy B5.

National Environmental Standards (NES)

392. In accordance with section 104(1)(b)(i), the consent authority must, subject to Part 2, have regard to any relevant provision of a National Environmental Standard (NES).

393. I consider the following NES are of most relevance to this application:

a. National Environmental Standards for Air Quality Regulations 2004; and

b. National Environmental Standard for Sources of Human Drinking Water Regulations 2007.

National Environmental Standards for Air Quality Regulations 2004 (NESAQ)

394. The NESAQ and compliance with the NESAQ is discussed in detail in the 'Legal and Planning' and 'Assessment of Actual and potential adverse effects' sections of this report. To summarise, my recommendation is that the application must be declined in accordance with Regulation 17(1) of the NESAQ.

National Environmental Standard for Sources of Human Drinking Water Regulations 2007

395. The NES for sources of drinking water was gazetted in June 2008. The purpose of the standard is to reduce the risk of human drinking water becoming contaminated. Under the NES for sources of human drinking water regional councils are specifically required to "*place conditions on relevant resource consents that require notification of drinking water suppliers if significant unintended events occur (eg: spills) that may adversely affect human drinking water."* The relevant regulations of the NES for sources of human drinking water are discussed below.

396. **Regulation 12** *'Condition on resource consent if activity may significantly adversely affect registered drinking water supply'* states the following:

(1) *"When considering a resource consent application, a consent authority must consider whether the activity to which the application relates may-*

(a) Itself lead to an event occurring (for example, the spillage of chemicals) that may have a significant adverse effect on the quality of the water at any abstraction point; or

(b) As a consequence of an event (for example, an unusually heavy rainfall) have a significant adverse effect on the quality of water at any abstraction point.

(2) *If the consent authority considers that the circumstances in subclause (1) apply, and it grants the application, it must impose a condition on the consent.*

(3) *The condition must require the consent holder to notify, as soon as reasonably practical, the registered drinking-water supply operators concerned and the consent authority, if an event of the type described in subclause (a) occurs that may have a significant adverse effect on the quality of the water at the abstraction point."*

397. The applicant did not assess the relevant provisions of the NES for Sources of Human Drinking Water in their application. Given Dr Scott's conclusions that the risk to SDC's Claremont bore is very low, I do not consider Regulation 12 is relevant to the proposal.

Other Regulations: Resource Management Measurement and Reporting of Water Takes Regulations 2010 (the Regulations)

398. Section 104(1)(b)(ii) of the RMA states that when considering an application for resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to any relevant provisions of other regulations.

399. The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 were *Gazetted* on 26 August 2010 and apply to holders of water permits which allow freshwater to be taken at a rate of 5 litres per second or more, in accordance with Regulation 4(1).

400. The existing instantaneous rate of take is 9.5 litres per second. This is greater than the 5 litres per second threshold in Regulation 4(1). Regulation 4(2) excludes non-consumptive takes from compliance with the Regulations. The applicant has assessed the relevance of the Regulations, highlighting that the use of water for dust suppression will be consumptive and therefore, the regulations are relevant to the take.

401. The applicant notes that a water meter has recently been installed on bore M36/0257 to measure the existing water take at the site. I have recommended conditions requiring records to be provided to CRC in a form consistent with that required by the regulations.

Regional Policy Statement (RPS)

402. Under Section 104(1)(b)(v) of the RMA, the consent authority shall have regard to the relevant provisions of a regional policy statement. The Canterbury Regional Policy Statement (RPS) became operative on 15 January 2013 and provides an overview of the significant resource management issues facing the Canterbury Region, including issues of resource management and Ngāi Tahu.

403. Overall, the applicant considers the proposal is consistent with the relevant provisions of the RPS.

404. An assessment of the objectives and policies which are considered relevant to the proposed activity are detailed below:

Chapter 6: Recovery and rebuilding of greater Christchurch

405. Chapter 6 *"Recovery and rebuilding of greater Christchurch"* was inserted into the RPS under section 27 of the Canterbury Earthquake Recovery Act 2011. The chapter provides a resource management framework to enable and support earthquake recovery and rebuilding.

406. The applicant considers enabling extraction of gravel from the site assists in support of rebuilding and development within Christchurch as sought by Objective 6.2.1.

407. Subsection (6) of Objective 6.2.1 seeks that recovery, rebuilding and development are enabled within Greater Christchurch through a land use and infrastructure framework that maintains or improves the quality and quantity of groundwater in aquifers and surface water bodies and quality of ambient air during the recovery, rebuilding and development of Greater Christchurch (in addition to other factors).

408. The intent of Objective 6.2.1 is to recognise existing constraints in terms of successful growth management and identified the key elements of natural and physical resources that must be protected to ensure harm to the natural environment is minimised.

409. The applicant considers their proposal includes appropriate mitigation and remediation measures to ensure that any effects are on groundwater and air quality are acceptable.

410. In terms of groundwater effects, it is concluded that the activity which represents the greatest risk to groundwater quality is the deposition of cleanfill material, rehabilitation of the site and future land uses. Dr Scott considers the deposition of cleanfill material at the site has the potential to cause some degradation in aesthetic properties of groundwater, but this is likely to be of low impact and dissipate within a few hundred metres of the site. I consider there is potential for future land use activities which could result in unacceptable risk to groundwater long term. I recommend the use of a covenant on each land title associated with the site to exclude high intensity land uses that may cause effects on groundwater quality in future.

411. In terms of air quality, Ms Ryan considers air quality is expected to be maintained at acceptable levels for health effects relative to applicable air quality guidelines and standards for RCS and $PM_{2.5}$. PM_{10} will be minimised through the proposed mitigation for dust control and monitoring with dust trigger levels, which are expected to be conservative. Any increased exposure to PM_{10} from the quarry operation in the surrounding community is generally expected to be low, so that any effects on human health will be no more than minor. Overall, the proposal may result in adverse effects, but these are likely to be minor in nature and localised.

Chapter 7: Freshwater

412. Chapter 7 of the RPS *'Fresh water'* seeks to manage water in an integrated and sustainable manner.

413. Objective 7.2.1 *'Sustainable management of fresh water'* seeks fresh water resources to be sustainably managed to enable people and communities to provide for their economic and social well-being through abstracting and or using water provided three sub-sections are met as follows:

…

1. *The life-supporting capacity ecosystem processes, and indigenous species and their associated freshwater ecosystems and mauri of the fresh water is safe-guarded;*
2. *The natural character values of wetlands, lakes and rivers and their margins are preserved and these areas are protected from inappropriate subdivision, use and development and where appropriate restored or enhanced; and*
3. *any actual or reasonably foreseeable requirements for community and stockwater supplies and customary uses, are provided for.*

414. Objective 7.2.3 seeks the overall quality of freshwater in the region is maintained or improved, and the life supporting capacity, ecosystem processes and indigenous species and their associated freshwater ecosystems are safeguarded.

415. Policy 7.3.6 states:

…

1. *to manage activities which may affect water quality (including land uses), singularly or cumulatively,to maintain water quality at or above the minimum standard set for that water body;*

…

416. Policy 7.3.7 seeks:

To avoid, remedy or mitigate adverse effects of changes in land uses on the quality of fresh water (surface or ground) by:

1. *identifying catchments where water quality may be adversely affected, either singularly or cumulatively, by increases in the application of nutrients to land or other changes in land use; and*
2. *controlling changes in land uses to ensure water quality standards are maintained or where water quality is already below the minimum standard for the water body, it is improved to the minimum standard within an appropriate timeframe.*

417. In terms of Objective 7.2.1 I do not consider the applicant's proposal will inhibit the sustainable management of freshwater.

418. Based on Dr Scott's evidence, it is likely that the deposition of cleanfill could cause adverse aesthetic effects on groundwater in some down gradient bores. Given this, I consider it is unlikely the applicant's proposal will affect the overall freshwater quality in the region and will continue to safeguard the life supporting capacity, ecosystem processes, indigenous species and their associated freshwater ecosystems as sought by Objective 7.2.3.

419. Based on advice from Dr Scott, and subject to careful compliance with conditions, I consider the applicant can undertake their proposal in a manner that is consistent with Policy 7.3.6 and 7.3.7.

Chapter 14: Air Quality

420. Chapter 14 of the RPS includes objectives and policies that seek to ensure the life-supporting capacity and/or mauri of air is safeguarded and highlights its importance for promoting the sustainable use of this natural resource.

421. The applicant considers the proposal is consistent with the objectives and policies of Chapter 14.

422. Objective 14.2.1 seeks that ambient air quality is maintained or improved so that it is not a danger to people's health and safety and to reduce the nuisance effects of low ambient air quality.

423. I consider Objective 14.2.1 is relevant to this proposal. As concluded by Ms Ryan, at this stage there is uncertainty in the level of adverse effects on ambient air quality that may be experienced due to difficulties establishing compliance with Regulation 17(1) of the NESAQ. Based on Ms Ryan's advice, I consider the current application, may result in brief exceedances of the 2.5μ/m³ PM_{10} threshold in the polluted Christchurch Airshed. Given this, I do not consider the applicant's proposal, in its current state, will maintain or improve ambient air quality in the Christchurch Airshed.

424. In terms of ambient air quality at the site, Ms Ryan considers that PM_{10} concentrations have already been shown to approach the NESAQ standard of 50μ/m³, therefore a high level of dust control and management is critical to ensure any increases of PM_{10} are minor. In terms of nuisance effects, Ms Ryan considers with the implementation of dust measures as proposed by the applicant, a minor adverse effect is likely to be limited to sensitive receptors within 250 metres of the proposed quarry site.

425. Objective 14.2.2 is relevant to localised adverse effects of discharges on air quality and states:

Enable the discharges of contaminants into air provided there are no significant localised adverse effects on social, cultural and amenity values, flora and fauna, and other natural and physical resources.

426. Ms Ryan does not consider the discharge of contaminants into air will result in significant adverse effects, therefore I consider the proposal is consistent with Objective 14.2.2.

427. Policy 14.3.1 states:

In relation to ambient air quality:

1. *To set standards to maintain ambient air quality in Canterbury based on concentrations of contaminants that cause adverse health effects and nuisance*
2. *Where existing ambient air quality is higher than required by the standards set, to only allow the discharge of contaminants into air where the adverse effects of the discharge on ambient air quality are minor.*
3. *To give priority to ensuring that PM_{10} ambient air quality improvements are achieved in Rangiora, Kaiapoi, Christchurch, Ashburton, Timaru, Geraldine and Waimate.*

428. Policy 14.3.1(2) only applies where ambient air quality is higher than the standard set. As mentioned above, Ms Ryan considers that PM_{10} concentrations have already been shown to approach the NESAQ standard of 50µ/m³, therefore a high level of dust management is critical to ensure the any increases of PM_{10} are minor and the discharge enabled by Policy 14.3.1(2).

429. Policy 14.3.2 seeks:

To set standards, conditions and terms for discharges of contaminants into the air to avoid, remedy or mitigate localised adverse effects on air quality.

430. If compliance with Regulation 17(1) of the NESAQ can be achieved, I recommend the inclusion of several conditions to mitigate and avoid localised adverse effects on air quality in accordance with Policy 14.3.2.

431. Policy 14.3.5 states:

In relation to the proximity of discharges to air and sensitive land-uses:

1. *To avoid encroachment of new development on existing activities discharging to air where the new development is sensitive to those discharges, unless any reverse sensitivity effects of the new development can be avoided or mitigated.*
2. *Existing activities that require resource consents to discharge contaminants into air, particularly where reverse sensitivity is an issue, are to adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment.*
3. *New activities which require resource consents to discharge contaminants into air are to locate away from sensitive land uses and receiving environments unless adverse effects of the discharge can be avoided or mitigated.*

432. Policy 14.3.5(3) is particularly relevant to the application. There are 15 dwellings identified by the applicant that do not meet the separation distances in the EPA Victoria Guidelines, therefore Ms Ryan considers, a high level of vigilance in applying dust controls will be necessary to internalise adverse effects. Ms Ryan does consider

there could still be an adverse effect on the surrounding community, but these are likely to be minor. Land parcels located directly adjacent to the applicant's site are classified as 'Rural' in the Selwyn District Plan. I consider infrequent discharges of dust (such as resulting from the ploughing of a paddock) forms part of the rural environment. I consider the wording of the policy is directive in that it requires the avoidance or mitigation of adverse effects. Ms Ryan considers there are still likely to be localised adverse effects to a minor level for those within 250 metres resulting from the proposal, on this basis I consider the proposal is inconsistent with Policy 14.3.5(3) as the new activities are not located a sufficient distance from sensitive activities to ensure that effects are avoided or mitigated.

Chapter 15: Soils

433. Chapter 15 of the RPS includes objectives and policies related to soils. Induced soil erosion and the loss of soil qualities are the resource management issues addressed in Chapter 15.

434. The applicant considers the proposal gives effect to the relevant objectives and policies and will not adversely affect soil resources.

435. Objective 15.2.1 seeks the maintenance and improvement of the quality of Canterbury's soils to safeguard their mauri, life-supporting capacity and health and productive capacity.

436. Objective 15.2.2 requires the prevention of new significant induced soil erosion.

437. Policy 15.3.1 seeks, in relation to soil, that land use and land management practices avoid significant long-term adverse effects on soil quality and to promote land-use practices that maintain and improve soil quality.

438. Policy 15.3.2 requires avoidance of significant new induced soil erosion resulting from use of land.

439. I agree that the applicant's proposal is able to be undertaken in manner that is consistent with the objectives and policies listed above.

Canterbury Land and Water Regional Plan (CLWRP)

440. Under section 104(1)(b)(vi) of the RMA, the consent authority shall have regard to the relevant provisions of a plan or proposed plan.

441. The applicant considers their proposal is consistent with the objectives and policies of the CLWRP that are relevant to their proposed activity.

442. The CLWRP is intended to operate at two-levels. There is a region-wide section, which contains the objectives and policies which apply across the whole region and ten sub-regional sections which apply to individual regions. While it is noted in the CLWRP that the objectives and policies are intended to be read and applied together as a comprehensive suite, I consider the following are most relevant to the proposal.

Objectives

443. **Objective 3.8A** of the CLWRP states:

High quality fresh water is available to meet actual and reasonably foreseeable needs for community drinking water supplies.

444. In terms of Objective 3.8A, I do not consider it likely that the applicant's proposal will affect the availability of fresh water for community drinking water supplies. As assessed by Dr Scott some well owners on properties adjacent to the downgradient boundary of the site could experience a small change in aesthetic quality of their water from the proposed activities, however the risk to SDC's existing Claremont

bore is very low. Overall, I consider the applicant's proposal will not inhibit the actual and reasonably foreseeable needs for community drinking water supplies and is consistent with Objective 3.8A.

445. **Objective 3.9** of the CLWRP states:

Abstracted water is shown to be necessary and reasonable for its intended use and any water that is abstracted is used efficiently.

446. **Objective 3.13** of the CLWRP states:

Groundwater resources remain a sustainable source of high quality water which is available for abstraction while supporting base flows or levels in surface water bodies, springs and wetlands and avoiding salt-water intrusion.

447. Objectives 3.9 and 3.13 are related to water quantity and the abstraction of water. The applicant does not propose to take any additional water over that already authorised by their existing consent. Given this, I consider the applicant's proposal is consistent with Objectives 3.9 and 3.13

448. **Objective 3.23** of the CLWRP states:

Soils are healthy and productive, and human-induced erosion and contamination are minimised.

449. With regards to Objective 3.23, I consider the applicant is proposing a method to store soils and overburden in a manner which will maintain the soil health and minimise contamination. As such, I consider the applicant's proposal is consistent with Objective 3.23.

450. **Objective 3.24** of the CLWRP states:

All activities operate at good environmental practice or better to optimise efficient resource use and protect the region's fresh water resources from quality and quantity degradation.

451. Objective 3.24 seeks that all activities operate at good environmental practice or better. I consider the applicant's proposal to discharge truck wash down water as trade waste can be considered as operating at 'good environmental practice'. Based on advice from Mr Freeman, I consider the WasteMINZ (2018) Guideline provides the most up-to-date guidance and best practice for waste disposal. At the time of writing this report, the applicant has proposed to undertake their cleanfilling operation in accordance with MfE guidelines (2002). While I do not consider the applicant's proposal in its current form is inconsistent with this objective, particularly given MfE still endorses the Cleanfill (2002) Guidelines as "advising the best practice methods for managing cleanfills"[84], I consider there is tension encountered by referring to material as 'best practice' where there is newer guidance material available.

Policies

452. Strategic **Policy 4.4** of the CLWRP states:

Groundwater is managed so that:

a. groundwater abstractions do not cause a continuing long-term decline in mean annual groundwater levels or artesian pressures;
b. the individual and cumulative rate, duration and volume of water pumped from bores is controlled so as to prevent seawater contamination;

[84] https://www.mfe.govt.nz/publications/waste/guide-management-cleanfills, 15 July 2019

c. *the rate and duration of individual abstractions is controlled to ensure that individually or cumulatively, localised pressure reversal does not result in the downward movement of contaminants;*
d. *in any location where an overall upwards pressure gradient exists, restrict the taking of groundwater so that at all times the overall upward pressure difference is maintained between any one aquifer and the next overlying aquifer;*
e. *overall water quality in aquifers does not decline; and*
f. *the exercise of customary uses and values is supported.*

453. In terms of groundwater quantity, the applicant is not proposing to take any additional water, given this it is not expected there will be any effects, other than those already authorised, on groundwater levels in accordance with Policy 4.4(a). Policy 4.4(e) states that groundwater should be managed so the overall quality in aquifers does not decline. As discussed above and in Dr Scott's evidence, it is likely that the deposition of cleanfill could cause adverse aesthetic effects on groundwater in some down gradient bores. As the effects are likely to be relatively localised, I consider the proposal to be consistent with this policy.

454. Strategic **Policy 4.7** of the CLWRP states:

Resource consents for new or existing activities will not be granted if the granting would cause a water quality or quantity limit set in Sections 6 to 15 to be breached or further over allocation (water quality and/or water quantity) to occur or in the absence of any water quality standards in Sections 6 to 15, the limits set in Schedule 8 to be breached. Replacement consents, or new consents for existing activities may be granted to:

a. *allow the continuation of existing activities at the same or lesser rate or scale, provided the consent contains conditions that contribute to the phasing out of the over allocation (water quality and/or water quantity) within a specified timeframe; or*
b. *exceed the allocation limit (water quality and/or water quantity) to a minor extent and in the short-term if that exceedance is part of a proposal to phase out the over-allocation within a specified timeframe included in Sections 6 to 15 of this Plan.*

455. The first limb of Policy 4.7 is most relevant to the proposal and states that resource consents for new or existing activities will not be granted if the granting of the resource consents would cause water quality limits set out in the plan to be breached. Based on Dr Scott's evidence and careful adherence to the conditions as recommended, the risk of breaching water quality limits in Table 11(m) of the CLWRP is expected to be low. Given this, I consider the proposal is consistent with this policy.

456. **Policy 4.11** of the CLWRP states:

The setting and attainment of catchment specific water quality and quantity outcomes and limits is enabled through:

a. *limiting the duration of any resource consent granted under the region-wide rules in this Plan to a period not exceeding five years past the expected notification date (as set out in the Council's Progressive Implementation Programme) of any plan change that will introduce water quality or water quantity provisions into Sections 6 – 15 of this Plan; but*

b. *allowing, where appropriate, a longer resource consent duration for discharge permits granted to irrigation schemes or principal water suppliers under the region-wide nutrient management rules in this Plan, provided those permits include conditions that restrict the nitrogen loss from the land and enable a review of the consent under section 128(1) of the RMA.*

457. In coming to a recommended duration in the sections below, I have had regard to Policy 4.11.

458. **Policy 4.13** of the CLWRP states:

For other discharges of contaminants into or onto land where it may enter water or to surface water bodies or groundwater (excluding those passive discharges to which Policy 4.26 applies), the effects of any discharge are minimised by the use of measures that:

a. *first, avoid the production of the contaminant;*
b. *secondly, reuse, recovers or recycles the contaminant;*
c. *thirdly, minimise the volume or amount of the discharge; or*
d. *finally, wherever practical utilise land-based treatment, a wetland constructed to treat contaminants or a designed treatment system prior to discharge; and*
e. *in the case of surface water, results in a discharge that after reasonable mixing meets the receiving water standards in Schedule 5 or does not result in any further degradation in water quality in any receiving surface waterbody that does not meet the water quality standards in Schedule 5 or any applicable Water Conservation Order.*

459. **Policy 4.14** of the CLWRP states:

Any discharge of a contaminant into or onto land where it may enter groundwater (excluding those passive discharges to which Policy 4.26 applies):

a. *will not exceed the natural capacity of the soil to treat or remove the contaminant; and*
b. *will not exceed available water storage capacity of the soil; and*
c. *where meeting (a) and (b) is not practicable, the discharge will:*

i. *meet any nutrient limits in Schedule 8 or Sections 6 to 15 of this Plan; and*
ii. *utilise the best practicable option to ensure the size of any contaminant plume is as small as is reasonably practicable; and*
iia. *ensure there is sufficient distance between the point of discharge, any other discharge and drinking-water supplies to allow for the natural decay or attenuation of pathogenic micro-organisms in the contaminant plume; and*
iii. *not result in the accumulation of pathogens, or a persistent or toxic contaminant that would render the land unsuitable for agriculture, commercial, domestic, cultural or recreational use or water unsuitable as a source of potable water or for agriculture; and*
iv. *not raise groundwater levels so that land drainage is impeded.*

460. **Policy 4.19** of the CLWRP states:

The discharge of contaminants to groundwater from earthworks, excavation, waste collection or disposal sites and contaminated land is avoided or minimised by ensuring that:

a. *activities are sited, designed and managed to avoid the contamination of groundwater;*
b. *existing or closed landfills and contaminated land are managed and monitored where appropriate to minimise any contamination of groundwater; and*
c. *there is sufficient thickness of undisturbed sediment in the confining layer over the Coastal Confined Aquifer System to prevent the entry of contaminants into the aquifer or an upward hydraulic gradient is present which would prevent aquifer contamination.*

461. Based on advice from Dr Scott, I consider the proposal is consistent with Policies 4.13, 4.14 and 4.19.

462. **Policy 4.23** of the CLWRP states:

Any water source used for drinking-water supply is protected from any discharge of contaminants that may have any actual or potential adverse effect on the quality of the drinking-water supply including its taste, clarity and smell and community drinking water supplies are protected so that they align with the CWMS drinking-water targets and meet the drinking-water standards for New Zealand.

463. Policy 4.23 seeks to protect groundwater quality from *"any discharge of contaminants which may have any potential effect on the quality of drinking water supply including its taste, clarity and smell"*. The initial focus of this policy is on all sources of drinking water, as Dr Scott states in her evidence, groundwater monitoring undertaken at the quarry sites has shown elevated concentrations of aesthetic determinants of groundwater quality.

464. It is likely that the activities, specifically deposition of cleanfill, proposed at the site will have an adverse effect on aesthetic aspects of groundwater quality for localised well owners. The applicant has proposed a range of management measures to be followed during excavations and cleanfilling to mitigate the risks on groundwater quality. If all potential sources of contamination are managed, there is unlikely to be a significant effect on groundwater quality. However, as Dr Scott has stated there is likely to be an effect on the aesthetic quality of groundwater which the initial limb of this policy seeks to protect.

465. I note that the second limb of this policy relates to the protection of community drinking water supplies so they align with the CWMS drinking-water targets and meet the drinking water standards for New Zealand. As discussed by Dr Scott in her evidence, there is a low risk of this occurring to public supply wells. Therefore, when assessing this policy as a whole, I consider the proposal is inconsistent with but not contrary to this policy.

466. **Policy 4.63** of the CLWRP states:

Any abstraction of groundwater is subject to conditions specifying:

a. *the maximum instantaneous rate of take;*
b. *a maximum seasonal volume based on reasonable use determined in accordance with Schedule 10 over the period the water is required;*
c. *the area or property within which the water is to be used;*
d. *the location of the abstraction;*
e. *any minimum groundwater levels at which abstraction ceases if specified in Sections 6 to 15;*
f. *any other conditions to regulate the rate or volume of water that may be abstracted relative to the estimated volume of groundwater stored in a groundwater zone, if specified in Sections 6 to 15; and*

g. *where the water is used for irrigation, the need for, compliance with, and auditing of a Farm Environment Plan.*

467. **Policy 4.64** of the CLWRP states:

Where existing abstractors do not have a maximum seasonal or annual allocation, to impose these conditions, determined in accordance with Schedule 10, when any of the following occur:

a. *resource consent conditions are changed in accordance with Section 127 of the RMA;*
b. *water permits are transferred;*
c. *existing resource consents to abstract water expire and are replaced; or*
d. *the consent authority determines that a review of consent conditions is required to impose seasonal or annual volumes in a catchment.*

468. **Policy 4.66** of the CLWRP states:

Water abstraction for irrigation is managed so that:

a. *winter flows are available for abstraction to storage, while ensuring ecosystem recovery through the maintenance of flow variability; and*
b. *unless specified otherwise, abstraction is for a defined annual volume determined in accordance with Schedule 10.*

469. Policy 4.63 sets out the conditions must be included on a water permit to abstract groundwater. All conditions are already included on the existing groundwater permit, except for an annual volume limit in accordance with Policy 4.63(b). Policies 4.64 and 4.66 also require the calculation of an annual volume in accordance with Schedule 10. The applicant has provided an annual volume, however based on advice from Mr Just, the annual volume calculated by the applicant is incorrect. I have recommended an annual volume calculated by Mr Just in accordance with Schedule 10 of the CLWRP be included as a recommended condition, if consents are granted. Given this, I consider the proposal is consistent with policies 4.63, 4.64 and 4.66 of the CLWRP.

470. **Policy 4.93** of the CLWRP is an activity specific policy for gravel extraction and states:

Recognise the value of gravel extraction for construction and maintenance of infrastructure, for economic activity, for flood management purposes and for the re-build of Christchurch.

471. Policy 4.93 requires the value of gravel extraction for construction and maintenance of infrastructure, for economic activity and for the re-build of Christchurch to be recognised. I consider the proposed use of the site as a quarry operation gives effect to this policy.

472. Similarly, **Policy 4.94** of the CLWRP is also an activity specific policy for land-based gravel extraction:

Enable the extraction of gravel from land, provided adverse effects on groundwater quality are minimised and remediation is undertaken to minimise any ongoing risk of groundwater contamination.

473. The first limb of Policy 4.94 seeks the extraction of gravel from land is enabled provided the adverse effects on groundwater quality are minimised. The applicant

has proposed a range of measures to mitigate the potential effects on groundwater quality. Based on advice from Dr Scott, management of excavation to ensure the maximum depth of one metre to highest groundwater level maintained and ensuring the risk of spills and leaks of fuels are minimised are key measures to ensure adverse effects on groundwater quality from the extraction of gravel are minimised.

474. I consider the critical element of Policy 4.94 is the second limb which seeks to ensure remediation is undertaken to minimise any ongoing risk to groundwater contamination. I consider the term 'remediation' referred to in this policy is broad and includes cleanfilling, rehabilitation and future land uses. In terms of cleanfilling, the applicant proposes to undertake their cleanfiling activity in accordance with the MfE (2002) Guidance. Based on Dr Scott's evidence and as concluded above, I consider a bond and covenant are appropriate include as consent conditions to ensure the ongoing risk to groundwater contamination is minimised as far as possible. Overall, I consider the proposal could be improved to further minimise the adverse effects on groundwater quality long term and ongoing risk of groundwater contamination. Accordingly, I consider the proposal is inconsistent with but not contrary to this policy.

Section 11 of the Canterbury Land and Water Regional Plan – Including Plan Change 1

475. Section 11 of the CLWRP provides policies specific to the Selwyn-Te Waihora sub-region under the Canterbury Water Management strategy.

476. **Policy 11.4.7** of the CLWRP states:

Reduce the total nitrogen load entering Te Waihora/Lake Ellesmere by restricting the losses of nitrogen from farming activities, industrial and trade processes and community sewerage systems in accordance with the target (the limit to be met over time) and limits in Tables 11(i) and 11(j).

477. **Policy 11.4.26** of the CLWRP states:

Only reallocate water to existing resource consent holders at a rate and volume that reflects:

a. for irrigation takes, reasonable use as calculated in accordance with Schedule 10; and
b. for other takes, despite Policy 4.50(b)(i), an amount of water that is reasonable and demonstrates efficient use of water for the particular end use.

478. **Policy 11.4.29** of the CLWRP states:

Until the allocation limits in Tables 11(e) are no longer exceeded, apply adaptive management conditions upon replacement of any groundwater resource consents that have previously been subject to adaptive management conditions, not less stringent than the pre-existing conditions.

479. I consider Policy 11.4.7 is relevant to both the operation proposed at the site and future land uses. On the basis of advice from Dr Scott, I do not consider the applicant's proposal will contribute to exceedances of the nitrogen load limit. I consider there is potential for future land uses at the site which could result in unacceptable risk to groundwater long term and could contribute to the total nitrogen load (if activities such as intensive farming etc. were to take place on site). To manage this long term, I have recommended conditions requiring a covenant be placed on all land titles limiting future land use, should consents be granted. Overall, I consider the applicant's proposal is consistent with Policy 11.4.7.

480. With regards to policies 11.4.26 and 11.4.29, the applicant does not propose to take any additional water above that which is already authorised under their existing water permit. Given this, I consider the proposal is consistent with policies 11.4.26 and 11.4.29.

Proposed Plan Change 7 to the CLWRP (pPC7)

481. Pursuant to section 88A(2) of the RMA, I have considered pPC7 in accordance with section 104(1)(b).

482. Policy 4.103 is introduced into the CLWRP by pPC7 and states:

Any resource consent granted with a consent condition requiring the collection of water quality samples, shall also include a condition requiring all water quality sample data to be submitted to the Canterbury Regional Council in a format suitable for automated upload to the Council's water quality database software.

483. As part of the groundwater monitoring condition suite, I have recommended a condition requiring data to be submitted in a format as described by the policy. Given this, I consider consistency with Policy 4.103 is achieved.

484. I do not consider there are any other policies in pPC7 that are relevant to the applicant's proposal.

Canterbury Air Regional Plan (CARP)

485. Under section 104(1)(b)(vi) of the RMA, the consent authority shall have regard to the relevant provisions of a plan or proposed plan.

486. The applicant considers the proposed activity at the site is consistent with the relevant objectives and policies of the CARP.

487. The objectives of the CARP identify the resource management outcomes or goals for air quality in the Canterbury Region. While the objectives and policies of the CARP should be read and considered together, I consider the following to be most relevant to the applicant's proposal:

488. **Objective 5.2** of the CARP states:

Ambient air quality provides for the health and wellbeing of the people of Canterbury.

489. **Objective 5.4** of the CARP states:

Degraded ambient air quality is improved over time and where ambient air quality is acceptable it is maintained.

490. **Policy 6.1** of the CARP states:

Discharges of contaminants into air, either individually or in combination with other discharges, do not cause:

a. adverse effects on human health and wellbeing; or
b. adverse effects on the mauri and life supporting capacity of ecosystems, plants or animals; or
c. significantly diminished visibility; or
d. significant soiling or corrosion of structures or property.

491. I consider objectives 5.2 and 5.4 and Policy 6.1 are key in assessing the applicant's proposal against the CARP. Objectives 5.2 and 5.4 refer to 'ambient air quality', Objective 5.2 seeks that ambient air quality, region-wide, provides for the health and

wellbeing of Canterbury and Objective 5.4 seeks to improve degraded ambient air quality over time, or maintain ambient air quality where it is acceptable.

492. At this stage there is uncertainty in the level of adverse effects on ambient air quality that may be experienced due to difficulties establishing compliance with Regulation 17(1) of the NESAQ. Based on Ms Ryan's advice, I consider the current application, may result in brief exceedances of the 2.5μ/m³ PM_{10} threshold in the polluted Christchurch Airshed. Given this, I do not consider the applicant's proposal, in its current state, will maintain or improve ambient air quality in the Christchurch Airshed. This would inhibit the ability to achieve Objective 5.2 and is contrary to Objective 5.4 which is to improve ambient air quality where it is degraded.

493. I consider Policy 6.1 is directive and as a result considerable weight can be placed on this policy when having regard to the relevant provisions of the CARP. Parts (a) and (b) of Policy 6.1 seek discharges of contaminants into air do not cause adverse effects on human health, wellbeing, the mauri and life supporting capacity of ecosystems, plants or animals. I consider the threshold of 'adverse effects' to be low and as concluded in Ms Ryan's assessment, the proposal could result in adverse effects to a low level on the surrounding community.

494. In terms of part (a), as mentioned in the assessment above, there is uncertainty in establishing compliance with the NESAQ which is set to provide a guaranteed level of health for all New Zealanders. The application in its current state could result in brief exceedances of the 2.5μ/m³ PM_{10} threshold in an already polluted airshed, given this I consider the proposal could cause adverse effects on human health and wellbeing which part (a) seeks to protect.

495. Ms Ryan considers there will be no adverse effect on plants and animals. On this basis, I consider the applicant's proposal is consistent with part (b) of Policy 6.1. Parts (c) and (d) seek that discharges into air do not cause significant effects on amenity. Based on advice from Ms Ryan, I do not consider the applicant's proposal will result in significant effects, and the proposal is consistent with parts (c) and (d).

496. **Objective 5.6** of the CARP states:

Amenity values of the receiving environment are maintained.

497. **Objective 5.9** of the CARP states:

Offensive and objectionable effects and noxious or dangerous effects on the environment are generally avoided.

498. **Policy 6.8** of the CARP states:

Offensive and objectionable effects are unacceptable and actively managed by plan provisions and the implementation of management plans.

499. Objectives 5.6 and 5.9 and Policy 6.8 are also important considerations for this application. In terms of Objective 5.6, Ms Ryan considers the proposal may have a minor amenity or nuisance effect, but this is likely to be limited to those within 250 metres of the proposed quarry site. At this stage, the applicant does not have enough water available for all uses proposed at the site, jeopardising their ability to effectively mitigate dust produced. As Objective 5.6 seeks that amenity values of the receiving environment are maintained, I consider the applicant's proposal is contrary to Objective 5.6.

500. In terms of Objective 5.9 and Policy 6.8, Ms Ryan considers a high level of dust control will be needed to ensure there is no offensive and objectionable dust to the extent there is an adverse effect on the nearest neighbouring dwellings. The applicant has provided a draft Dust Management Plan for the site and has proposed

several dust mitigation measures to actively manage the production of dust at the site and reduce the likelihood of offensive and objectionable effects. Subject to diligent and consistent implementation of dust mitigation measures, I consider the applicant's proposal can be undertaken in a manner that is consistent with Objective 5.9 and Policy 6.8.

501. **Objective 5.7** of the CARP states:

Discharges from new activities are appropriately located to take account of adjacent land uses and sensitive activities.

502. **Policy 6.9** of the CARP states:

Discharges into air from new activities are appropriately located and adequately separated from sensitive activities, taking into account land use anticipated by a proposed or operative district plan and the sensitivity of the receiving environment.

503. Objective 5.7 seeks that discharges from new activities are appropriately located to take into account of adjacent land uses and sensitive activities, this is implemented by Policy 6.9. There are 15 dwellings identified by the applicant that do not meet the separation distances in the EPA Victoria Guidelines, therefore Ms Ryan considers, a high level of vigilance in applying dust controls will be necessary to internalise adverse effects.

504. Land parcels located directly adjacent to the applicant's site are classified as 'Rural' in the Selwyn District Plan. I consider infrequent discharges of dust (such as resulting from the ploughing of a paddock) forms part of the rural environment. Ms Ryan considers there are still likely to be localised adverse effects to a minor level for those within 250 metres resulting from the proposal. Given this, I consider the proposal is inconsistent with, but not contrary to Objective 5.7 and Policy 6.9.

505. **Policy 6.11** of the CARP states:

When evaluating resource consent applications recognise locational constraints on activities, when imposing terms and conditions.

506. **Policy 6.12** of the CARP states:

Where activities locate appropriately to mitigate adverse effects on air quality a longer consent duration may be available to provide on-going operational certainty.

507. If the issues relating to compliance with Regulation 17(1) of the NESAQ are resolved and the Hearing Panel are of a mind to grant the resource consent, I have included a set of recommended conditions. As stated in the previous sections of this report, it is intended that this set provides a starting point for discussions and it is anticipated that these conditions will be further refined through conferencing and caucusing between the date this report is circulated and the start date of the hearing. Given this, I consider recommended conditions are consistent with Policy 6.11. In terms of Policy 6.12, to provide certainty that that the applicant will have access to sufficient quantities of water to supress dust, I consider the duration of the resource consent (if granted) should align with that of CRC182422.

508. **Policy 6.22** of the CARP states:

Applications for resource consent for discharges of contaminants into air from large scale fuel burning devices and industrial or trade activities shall identify the best practicable option to be adopted to minimise effects.

509. Policy 6.22 requires adoption of the best practicable option to minimise effects. Both the applicant and Ms Ryan agree that the application is consistent with good practice management, control and monitoring for dust discharges at quarries. Therefore, I consider the application is consistent with this policy.

510. **Policy 6.25** of the CARP states:

Applications for resource consent for discharges into air from industrial or trade activities or large scale fuel burning devices classified as discretionary shall address:

a. where the discharge includes PM_{10}, the mass emission rate of the proposed discharge relative to the total emission rate of all discharges within the Clean Air Zone; and the degree to which the proposed discharge exacerbates cumulative effects within the Clean Air Zone; and
b. localised effects of the proposed discharge and the location of sensitive receptors; and
c. available mitigation and emission control options; and
d. the duration of consent being sought and the practicability for the effects of the discharge to be reduced over time.

511. Policy 6.25 is only applicable to discretionary activities. In terms of Policy 6.25(a), It is my understanding, there is limited information that can be provided to show total emission rates of PM_{10} from fugitive sources (this is also the difficulty associated with satisfying the requirements of NESAQ Regulation 17(1)). The application includes information that supports policies 6.25(b) and (c). In terms of Policy 6.25(d), the applicant has sought a duration of 35 years, but does not propose any measures to reduce effects of the discharge over time.

512. **Policy 6.26** of the CARP states:

When considering applications for resource consent for the discharge of contaminants into air from large scale fuel burning devices or from industrial, trade or commercial activities, the CRC will consider the combined effect of all consented discharges into air occurring on the property.

513. In terms of Policy 6.26, there are no active resource consents to discharge contaminants into air at the site.

Summary

514. Overall, I consider the proposal is consistent with the relevant provisions of the NPSFM and RPS. I consider there is some inconsistency with the relevant provisions in the Air Quality chapter of the RPS. In terms of the CLWRP, I consider the proposal is generally consistent with relevant objectives and policies. I have assessed that there are some policies that the proposal is inconsistent with but not contrary to regarding groundwater quality. I have assessed that the proposal is inconsistent with and contrary to some of the relevant objectives and policies in the CARP related to ambient air quality.

PART 2 MATTERS

515. Under section 104(1) of the RMA, the consent authority must consider applications "subject to Part 2" of the Resource Management Act 1991 (RMA), specifically sections 5, 6, 7 and 8.

516. The Court of Appeal has recently 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 (in summary):[85]

[85] *R J Davidson Family Trust v Marlborough District Council* [2018] NZCA 316.

a. 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.

b. 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.

c. 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.

d. If it appears that the relevant planning documents have not been prepared in a manner that reflects the provisions of Part 2, the consent authority is required to consider Part 2.

517. The CLWRP and CARP are both operative plans prepared in a manner that reflects the provisions of Part 2. Proposed Plan Change 7 (PC7) to the CLWRP has recently been notified, however no changes proposed by PC7 are relevant in assessing the applicant's proposal.

518. The Resource Legislation Amendment Act 2017 inserted section 6(h) into the RMA.[86] While the CLWRP and CARP predate this addition, I do not consider section 6(h) to be relevant to the applications subject of this report.

519. On this basis, I am satisfied that the relevant regional plans give effect to the relevant provisions of the higher order instruments and that being the case I have not referred to them in my recommendation. On this basis, I have not resorted directly back to Part 2 when coming to my recommendation on this proposal.

OTHER RELEVANT MATTERS

520. Section 104(1)(c) of the RMA allows the Consent Authority to consider any other matter relevant and reasonably necessary to determine the application. I consider the other matters that the Hearing Panel may wish to consider include:

a. The Mahaanui Iwi Management Plan 2013;

b. Canterbury Regional Gravel Management Strategy;

c. Decisions of the Environment Court; and

d. Previous Council decisions.

The Mahaanui Iwi Management Plan 2013

521. An assessment of the relevant provisions of the Mahaanui Iwi Management Plan are provided in the Actual and potential adverse effects on Ngai Tahu cultural values.

[86] Management of signifigant risks from natural hazards

Overall, it is considered the applicant proposes to undertake their proposal in a manner that is consistent with the Mahaanui Iwi Management Plan.

Canterbury Regional River Gravel Management Strategy

522. The Canterbury River Gravel Management Strategy provides a framework for managing the extraction of gravel from rivers across Canterbury.

523. There is some discussion about land-based quarry operations in the strategy, however the document doesn't clearly advocate for one method of quarrying over the other. Therefore, I do not consider there to be any relevant provisions in the strategy to be assessed.

Previous Council Decisions

524. CRC have granted several resource consents for quarrying in the Canterbury Region, specifically within the hinterland of Christchurch City. Most of these are within the bounds of Christchurch City Council, with very few applications received for undertaking land-based quarry activities within the jurisdiction of Selwyn District Council.

525. The most recent decision on a resource consent for quarry-based activities was the decision to grant resource consents for the expansion of a quarry at Yaldhurst operated by Road Metals Company.[87] This application was limited to the extraction of material (no processing) at 581, 619 and 635 Buchanans Road and 350 West Coast Road. My recommendations on conditions takes into account the consent conditions included on the recent Road Metals Company consents, particularly the new conditions about dust monitoring and responses to that monitoring. I am not aware of any other consents granted recently for new or extended quarries in Canterbury.

CONSIDERATION OF APPLICATION

Section 104 – Consideration of Applications

526. Section 104(1) of the RMA sets out what the consent authority must, subject to Part 2, have regard to when considering a resource consent application.

527. In terms of section 104(1)(a) of the RMA, the applicant has concluded that the adverse effects of the activity on the environment can be appropriately avoided, remedied or mitigated to a level which is minor.

528. The audit of the applicant's proposal and associated technical information has determined that the application will result in adverse effects on the environment that are minor, even if undertaken in accordance with the recommended conditions that reflect best practice. Several of the mitigation measures proposed by the applicant are based on human judgement to determine and implement appropriate measures. There is no room for error or complacency when implementing measures, particularly when works occur in very close proximity to neighbouring dwellings.

529. Section 104(1)(ab) of the RMA requires the consent authority to, have regard to:

"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"

[87] CRC181274

530. The applicant has provided an assessment of positive effects associated with the proposal as set out in the sections above.

531. In accordance with section 104(1)(b) I have had regard to all relevant provisions to this application. The relevant objectives and policies are identified and assessed above. Overall, I consider the application is not contrary to the relevant objectives and policies, although it is inconsistent with some individual objectives and policies.

532. As required by section 104(1)(b)(i), I have had regard to the NESAQ. In accordance with Regulation 17(1) of the NESAQ, the discharge of dust into air may be likely, at any time, to increase the concentration of PM_{10} by more than 2.5 micrograms per cubic metre in the polluted Christchurch Airshed. Given this, I recommend the resource consent applications be refused.

533. In accordance with section 104(1)(c), I have had regard to any other matters relevant to this application as set out in the sections above.

Section 104B – Determination of applications for discretionary or non-complying activities

534. After considering an application for a resource consent for a **discretionary activity,** a consent authority:

a. *May grant or refuse the application; and*

b. *If it grants the application, may impose conditions under section 108 of the RMA.*

535. I have considered section 104B of the RMA and I recommend that this application should be refused. This recommendation is based on Regulation 17(1) of the NESAQ.

Section 105(1) – Matters relevant to certain applications

536. Section 105 of the RMA states:

"(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…"

537. In accordance with section 105 of the RMA, CRC must have regard to (a) to (c) in the context of the discharge permits applied for by the applicant. In accordance with section 105(1)(a), I have had regard to the nature of the discharge and sensitivity of the receiving environment to adverse effects in the earlier sections of this report. I have provided a brief summary of the applicant's reason for the proposed choice and any possible alternative methods of discharge required by section 105(1)(b) and (c) in the sections below. The applicant has considered a range of alternatives in Section 5.0 (page 26) of their application.

Discharge permit to discharge contaminants into air from an industrial or trade premise or process and large scale fuel burning device

538. The applicant considers the discharge of contaminants into air is a reflection of the location of the quarry site, the type of material to be extracted, extraction and processing activities, access roads and the direction and strength of wind. It is concluded by the applicant that it is only through the adoption of appropriate dust mitigation 'methods' that the effects of such can be controlled and mitigated. Overall the applicant concludes that the proposed method of discharge is the only practicable method and with the quarry operational design and mitigation measures proposed is considered to represent best practice within the local aggregate industry.

539. I agree with the applicant and consider the location of the proposed quarry and proximity to residential dwellings require diligent and consistent implementation of dust mitigation measures to minimise and internalise adverse effects. As considered by Ms Ryan, the dust mitigation measures proposed by the applicant meets an appropriate benchmark for determining good dust management within the quarry industry.

Discharge permit to discharge permit to discharge stormwater into land where contaminants may enter groundwater

540. The applicant considers the discharge of stormwater into land provides an effective means of stormwater treatment and disposal, given that they consider that the only contaminant of concern is silt.

541. In accordance with Dr Scott's advice:

> *"Removal of contaminants to background levels before reaching any offsite wells will be more likely if the discharge points for stormwater can be located on the upgradient side of the site and above a thick unsaturated zone (i.e. at the original ground level)."*[88]

542. The applicant has not proposed the locations of stormwater ponds at this stage as these are likely to change as staging of the operation progresses. I agree with the applicant that discharging stormwater to land is an appropriate method, given the likely contaminants and constraints. I acknowledge that there may be some difficulties in achieving Dr Scott's recommendation of a thick unsaturated zone between the discharge point and seasonal highest groundwater level.

Discharge permit to discharge contaminants into land where contaminants may enter groundwater associated with the deposition of cleanfill for site rehabilitation

543. The applicant considers the discharge arising from the deposition of clean fill will result in less than minor effects on groundwater quality and have proposed to maintain a separation distance of 1 metre to seasonal highest groundwater level to further mitigate risk to groundwater quality.

544. Advice from Dr Scott confirms that deposition of cleanfill at the site may result in some degradation in the aesthetic properties (e.g. hardness, taste, potential discoloration) of high-quality groundwater below the site, even with the 1 metre buffer. I consider there are limited alternative methods of discharge available to the applicant to undertake this discharge.

Summary

545. Overall, the applicant considers there are very few alternatives to the methods of discharge proposed from the site. I consider there are some alternatives in addition to those provided which the applicant has not assessed.

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[88] Paragraph 62 of Dr Scott's evidence.

Section 107(1) – Restrictions on grant of certain discharge permits

546. Under Section 107(1) of the RMA a consent authority may not grant a consent for the discharge of a contaminant into water, or onto or into land, if after reasonable mixing the discharge is likely to give rise in the receiving waters, to:

"(c) The production of conspicuous oil or grease films, scums, foams, floatable or suspended material:

(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."

547. Provided the applicant undertakes their proposal in accordance with the conditions recommended, I consider the effects above are unlikely to occur.

RECOMMENDATION

548. I recommend, pursuant to sections 104, 104B, 105, 107 and 108 and subject to Part 2 of the RMA to **REFUSE** the applications by Fulton Hogan Limited for resource consents to establish and undertake a gravel quarry and cleanfill operation at 107 Dawsons Road and 220 Jones Road, Templeton.

549. If compliance with Regulation 17(1) of the NESAQ is able to be achieved, or an offset is proposed in accordance with Regulation 17(3), I will reconsider my recommendation. I anticipate that this could be reasonably expected to occur following caucusing or conferencing on the matter and would be filed as a supplementary section 42A report.

Duration

550. In the event this application is granted, I have discussed a proposed duration below.

551. The applicant has sought the following durations:

a. An unlimited duration for all land use consents;

b. 35 years for discharge permits; and

c. The proposed expiry date for the water permit is 1 July 2032, which is the same expiry date as the existing water permit (CRC182422).

552. In considering the requested duration I have had regard to the following matters:

a. the nature and sensitivity of the affected environment, including

i. the degree to which the sensitivity of the affected environment may become more sensitive over time; and

ii. the probability of future adverse effects arising from the consented activity; and

iii. the level of knowledge about the affected environment;

b. the nature of the activity; and

c. the policies of the CLWRP and the CARP.

553. I consider a duration of 13 years for the following reasons:

a. The applicant's existing water permit expires in 13 years, aligning the expiry dates of all consents enables the proposal in its entirety to be thoroughly

assessed through the renewal process. Additionally, the applicant may not be guaranteed the same volumes of water as currently authorised.

b. Policy 4.11 of the CLWRP seeks the attainment of catchment specific water quality and quantity outcomes is enabled through limiting the duration of resource consents to a period of no more than five years past the expected notification date of a sub-regional plan process. The Selwyn Te-Waihora sub regional plan process is operative (Plan Change 1 to the LWRP). However, the Long Term Plan states that the follow up Selwyn-Te Waihora process is targeted for 2025/2026. A duration of 13 years is just beyond the 5-year timeframe set out in Policy 4.11, but provides a consistent expiry across all resource consents.

RECOMMENDED CONDITIONS

554. If the Hearing Panel is of a mind to grant this application, I have recommended conditions for consideration. As mentioned in the introductory sections to this report, it is intended that these conditions are a starting point for discussion and further refinement. These are attached in Appendix 7.

Signed:  Date: 30/08/2019

Name: Hannah Goslin

Consultant Planner

Signed by Reviewer:  Date: 30/08/2019

Name: Jacqui Todd

Principal Consents Planner

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