

IN THE MATTER OF

The Resource Management Act 1991

AND

IN THE MATTER OF

Applications for new Land Use Consents CRC155160, CRC155161, CRC155162, CRC155163, CRC155164, CRC155165, CRC155166, CRC155167, CRC155168 and CRC155469.

Applications RMA92033380, RMA92028401, RMA92028406, RMA92028407, RMA92028408 and RMA92028409 to change of consent conditions under section 127 of existing Land Use Consents RMA92029369, RMA92026181, RMA92008224, RMA92022418, RMA92014177 and RMA92012793.

Applications for new Land Use Consents RMA92028410, RMA92028412, RMA92028413 and RMA92028414.

APPLICANTS

**THE ISAAC CONSTRUCTION COMPANY LIMITED
CHRISTCHURCH READY MIX CONCRETE LIMITED
FULTON HOGAN LIMITED
HAREWOOD GRAVELS LIMITED
KB CONTRACTING & QUARRIES LIMITED
WINSTONE AGGREGATES
ROAD METALS COMPANY LIMITED**

CONSENT AUTHORITIES

**CANTERBURY REGIONAL COUNCIL
CHRISTCHURCH CITY COUNCIL**

JOINT REPORT AND DECISION OF HEARINGS COMMISSIONERS

Sharon McGarry, Hugh Thorpe and David Mountfort

31 August 2016

Heard on 13-21 June 2016 in the Waimakariri Room at the offices of the
Canterbury Regional Council, 200 Tuam Street, Christchurch.

Representations and Appearances

Applicants:

Mr E. Chapman, Counsel (Duncan Cotterill)

Mr J. Blair, 3D Visualisation Specialist (Virtual View Limited)

Mr B. Warren, Chief Executive (Isaac Construction Limited)

Mr M. Copeland, Consulting Economist (Brown, Copeland and Company Limited)

Mr P. Savage, Environment and Resource Development Manager (Fulton Hogan Limited)

Mr L. Forbes, Canterbury Manager (Road Metals Limited)

Ms A. Cave Environmental Manager (Winstone Aggregates)

Mr T. McMorran, Principal Engineering Geologist (Golder Associates (NZ) Ltd)

Mr N. Thomas, Hydrogeologist (Pattle Delamore Partners Ltd)

Mr P. Callander, Senior Hydrogeologist (Pattle Delamore Partners Ltd)

Dr W. Temple, Consultant Toxicologist

Dr M. Sanders, Ecologist (Ryder Consulting Ltd)

Mr K. Bligh, Senior Planner (Golder Associates (NZ) Ltd)

Submitters:

Christchurch City Council

- **Mr B. Pizzey**, Counsel
- **Mr M. Bourke**, Senior Technician (CCC)
- **Dr L. Burbery**, Senior Groundwater Scientist (ESR)
- **Ms A. Mackenzie**, Senior Planner (Avanzar Consulting Ltd)

Ms J. Demeter

Ms L. Thornton

Canterbury Regional Council

- **Mr S. McCracken**, Senior River Engineer

Mr B. Hutchison

- **Dr N. Dudley Ward**, Senior Lecturer in civil engineering (University of Canterbury)

Mr E. Smith

Ms N. MacLean

Mr J. Turpin

Mr I. Scott

Ms C. Smith

Mr M. Mora

Water Rights Trust

- **Mr M. Rodgers**

- **Mr R. English**, Consulting Engineer (Twelfth Knight Consulting)

Ms A. McKenzie

Christchurch International Airport Limited

- **Mr B. Williams**, Counsel (Chapman Tripp)

- **Ms K. McKenzie**, Senior Planner – Land Use (CIAL)

Ms D. Kingi-Patterson

Dr S. Gaw, Director of Environmental Science and Senior Lecturer in environmental chemistry
(University of Canterbury)

Mr T. Ineson

Canterbury District Health Board

- **Dr A. Humphries**, Public Health Physician

Ms A. McDonagh

Mr C. Pearson

Te Ngāti Tūāhuriri Rūnanga and Te Taumutu Rūnanga (Ngāi Tahu)

- **Ms J. Burgman**, Kaumātua

- **Ms L. Murchison**, Planner

Mr W. Tewnion

Department of Corrections

- **Mr W. McKnight**, Corrections Officer

- **Mr A. Willis**, Consultant Planner (Planning Matters Limited)

The Yaldhurst Rural Residents Association

- **Ms S. Harnett Kikstra**, Committee member

- **Dr G. Fenwick**, Biologist (NIWA)

Mr D. Thomson

Mr G. Barclay

Mr C. Bennett

Mr R. Wynn-Williams

Ms A. Youngman

Written Statements of Evidence Tabled:

Mr W. Thomas

Transpower New Zealand Limited – Ms J. McFarlane

Section 42A Reporting Officers:

Ms E. Chapman, Planner (Christchurch City Council)

- **Mr A. Green**, Counsel (Brookfields Lawyers)
- **Mr F. Watt**, Environmental Consultant (GHD Limited)
- **Dr H. Rutter**, Senior Groundwater Hydrologist (Aqualinc Research Limited)
- **Ms A. Radburnd**, Senior Policy Planner (Christchurch City Council)

Ms H. Goslin, Consent Planner (Canterbury Regional Council)

Mr J. Harrison, Consent Planner (Canterbury Regional Council)

- **Dr L. Scott**, Senior Groundwater Quality Scientist (Canterbury Regional Council)
- **Mr M. Mortiaux**, Regional Manager – RMA Monitoring and Compliance (Canterbury Regional Council)

It is the decision of the Canterbury Regional Council and Christchurch City Council, pursuant to sections 104, 104B, 104D, 105 and 108, and subject to Part 2 of the Resource Management Act 1991, to REFUSE all of the applications sought, for the reasons outlined in this decision.

BACKGROUND AND PROCEDURAL MATTERS

1. This is the joint report and decision of independent Hearings Commissioners Ms Sharon McGarry (Chair), Dr Hugh Thorpe and Mr David Mountfort. We were appointed by the Canterbury Regional (**CRC** or '**ECan**') and the Christchurch City Council (**CCC**) to jointly hear and decide¹ applications by quarrying companies collectively referred to as the 'Canterbury Aggregates Producers Group' (**CAPG** or 'the Applicants') for new resource consents and changes to the conditions of existing resource consents to authorise deepening excavations and back filling, pursuant to the Resource Management Act 1991 (**RMA** or 'the Act').
2. The applications relate to ten existing quarry sites located at McLeans Island, Miners Road and Selwyn. A number of existing resource consents are held by the quarry companies for each site authorising land use activities and discharge activities, associated with the excavation of aggregate, the processing of aggregates, and the back filling of cleanfill material². The existing land use consents held for aggregate excavation generally limit depths to one metre (**m**) above the highest recorded groundwater level (**HRGL**). A number of sites within the Miners Road Rural Quarry zone³, which have been undertaking land use activities under existing use rights, require new resource consents from CCC to excavate deeper than 1m above HRGL.
3. No changes are sought to existing resource consents held for discharges to air associated with quarrying and processing.
4. The Selwyn quarry site, which is operated by Selwyn Quarries Limited, has been granted a change to the conditions of an existing land use consent by Selwyn District Council to deepen the quarry. A new resource consent is sought from ECan to excavate deeper and back fill.
5. The applications to both consent authorities were lodged in January 2015. The applications were publicly notified, at the Applicants' request, on 21 November 2015. A total of 614 submissions were received. 508 submissions were in opposition to the application and two submissions were in support, subject to the imposition of consent conditions.
6. The hearing to decide the applications commenced at 9.30am on Monday 13 June 2016 and evidence was heard over the course of seven days. The hearing was adjourned at 4.45pm on Tuesday 21 June 2016, to enable the provision of further information and the revision of proposed consent conditions.
7. We undertook site visits on Wednesday 22 June and Friday 24 June 2016, visiting each application site and the surrounding areas. We would like to thank the quarry companies for providing a guide at each application site and appreciate their flexibility with the timing of our visits.

¹ In accordance with section 102 of the Act.

² 'Cleanfill' material for back filling is defined by the conditions of existing consents or the CCC Cleanfill Bylaw.

³ Under the operative Christchurch City Plan.

8. Following the hearing adjournment, we were provided with further information and information regarding alternative sources of aggregate supply, which were circulated to the parties for comment. We were provided with the Applicants' written right of reply (**ROR**) on 26 July 2016.
9. The hearing closed on 9 August 2016, ten working days after provision of the written ROR, and following our determination that we had sufficient information to decide the applications.
10. Prior to the hearing, separate reports were produced pursuant to section 42A of the Act by ECan's Reporting Officers, Mr Joe Harrison and Ms Hannah Goslin, and the CCC's Reporting Officer, Ms Emma Chapman.
11. The 'ECan s42A Report' provided an analysis of the matters requiring consideration and recommended the resource consents sought be declined. Technical advice on the applications was provided by Dr Lisa Scott (ECan Groundwater Scientist), by way of a Supplementary Report attached to the ECan s42A Report (dated 12 May 2016).
12. The 'CCC s42A Report' provided an analysis of the matters requiring consideration and recommended the resource consents sought be declined. Technical review of the applications was provided by Dr Helen Rutter (Senior Groundwater Hydrologist at Aqualinc Research Limited), and Mr Fraser Watt (Environmental Consultant engaged by Aqualinc), which were attached to the CCC s42A Report.
13. All statements of evidence by expert witnesses were also pre-circulated, in accordance with the Act, and were pre-read and tabled at the hearing. Expert witnesses were directed to summarise their evidence and respond to questions from the Hearings Commissioners.

PRELIMINARY COMMENTS

14. Before moving onto the background of the applications and the hearing process, we would like to make two preliminary comments.
15. Firstly, we record our appreciation at the manner in which the hearing was conducted by all the parties taking part. In this respect, we would like to acknowledge input of the Reporting Officers and their technical advisors, and the willingness of the Applicants, various submitters and their advisors to accommodate a certain amount of dialogue during and after the hearing, via the approach we adopted. We also acknowledge the assistance of the ECan Hearings Administrator, Ms Alison Cooper, prior to, during and after the hearing process. The above actions promoted a smooth process that has greatly assisted us when assessing and determining the issues.
16. Secondly, we stress that the findings we have made and the decision we have arrived at are based squarely on the evidence presented and our consideration of that material.

THE APPLICATIONS

17. The following table from the ECan s42A Report summarised the existing resource consents held, the new resource consents sought and the changes to conditions of existing resource consents held:

Table 4: CAPG operating companies, existing resource consents and resource consent requirements.

Quarry operator	Resource consents	Activity	Condition change or new resource consent
McLeans Island			
Isaac Construction	CRC091324	Land use – excavation	New resource consent sought
	CRC091325	Discharge to air – contaminants	No change sought
	RMA92021801	Land Use – CCC	Change to conditions sought
	RMA92026181	Land Use – CCC	Change to conditions sought
Fulton Hogan and K B Contracting & Quarries	CRC136619	Discharge to land – stormwater and contaminated water Discharge to air – contaminants	No change sought
	CRC136350	Land use – structure to store hazardous substances	Not applicable – Hazardous substances only
	CRC142904	Land use – excavation and deposition	New resource consent sought
	RMA92022418	Land Use – CCC	Change to conditions sought
Harewood Gravels	CRC094105.1	Land use – excavation	New resource consent sought
	CRC094107	Discharge to air – contaminants	No change sought
	CRC120340	Deposit cleanfill – land use	New resource consent sought
	CRC120617	Discharge contaminants to land	No change sought
	RMA92018625	Land use – CCC	Change to conditions sought
Miners Road, Yaldhurst			
Fulton Hogan	No resource consent currently held from CCC	Rural Quarry Zone	New resource consent sought
	CRC072440	Land use – excavation	New resource consent sought
	CRC083798	Land use – deposition	New resource consent sought
	CRC011034	Discharge to land – wash water	No change sought
	CRC064236	Discharge to land – wash water	No change sought
	CRC070043	Discharge to air – combustion contaminants and dust	No change sought

18. The Applicants have applied for the following resource consents from ECan and CCC to authorise the proposed deepening and back filling activities at the following sites:

Consent Number	Operator
Miners Road Quarries	
CRC155161 – New Land Use Consent – to excavate and deposit cleanfill RMA92028406 – New Land Use Consent	Christchurch Ready Mix Concrete Limited 53 Kettlewell Drive
CRC155162– New Land Use Consent - to excavate and deposit cleanfill RMA92028414 – New Land Use Consent	Road Metals Company Limited 394 West Coast Road
CRC155163– New Land Use Consent - to excavate and deposit cleanfill RMA92028413 – New Land Use Consent	Winstone Aggregates 223 Old West Coast Road
CRC155166– New Land Use Consent - to excavate and deposit cleanfill RMA92028412 – New Land Use Consent	KB Contracting & Quarries Limited 95 Miners Road
CRC155167 – New Land Use Consent - to excavate and deposit cleanfill RMA92028410 - New Land Use Consent	Fulton Hogan Limited 26 Miners Road
McLeans Island Quarries	
CRC155160 – New Land Use Consent - to excavate and deposit cleanfill RMA92028401 – section 127 change to conditions of RMA92026181 RMA92028409 – section 127 change to conditions of RMA92012793	The Isaac Construction Company Ltd, Harewood Gravels Company Limited 160 McLeans Island Road
CRC155164 – New Land Use Consent - to excavate and deposit cleanfill RMA92028408 – section 127 change to conditions to RMA92014177	Harewood Gravels Company Limited 535 McLeans Island Road
CRC155165 – New Land Use Consent - to excavate and deposit cleanfill	KB Contracting & Quarries Limited 166 Conservators Road
CRC155168 – New Land Use Consent - to excavate and deposit cleanfill RMA92028407 – section 127 change to conditions to RMA92022418	Fulton Hogan Limited 166 Conservators Road
Selwyn Quarry	
CRC155169 – New Land Use Consent - to excavate and deposit cleanfill	Selwyn Quarries Limited 48 Selwyn Road

19. The application documentation described the proposed activity and the statutory and regulatory framework, and assessed the actual and potential environmental effects. The following documents were appended to the application:
- (i) *'Report on Potential Groundwater Effects Arising from Deepening of Quarries near Christchurch'* by Pattle Delamore Partners Limited dated December 2014;
 - (ii) Proposed changes to conditions;
 - (iii) Listed Land Use Register Records;
 - (iv) *'Preliminary Site Investigation – Yaldhurst Quarry and Cleanfill, 233 Old West Coast Road, Christchurch'* by Pattle Delamore Partners Limited dated December 2014; and
 - (v) Certificates of Title for the application sites.
20. In response to section 92 requests for further information by both ECan and CCC, the Applicants provided the following documents in March 2015:
- (i) *'Response to Section 92 Requests for Further Information'* by Golder Associates dated October 2015;
 - (ii) *'Technical background information on groundwater issues due to deepening of quarries near Christchurch'* by Pattle Delamore Partners Limited dated September 2015;
 - (iii) An updated *'Report on Potential Groundwater Effects Arising from Deepening of Quarries near Christchurch'* by Pattle Delamore Partners Limited dated October 2015; and
 - (iv) A tracked changes text of the above updated report.
21. The ECan and CCC s42A Reports provided accurate summaries of the key aspects of the applications, which we adopt⁴ and will not repeat here. In summary, however, we note that the applications require consents under the Land and Water Regional Plan (**LWRP**) to excavate deeper than 1m above the 'Seasonal High Water Table' (**SHWT**) and for the deposition of back fill⁵ material onto and into land; and under the operative City Plan to excavate deeper than 1m above the 'Highest Recorded Groundwater Level' (**HRGL**) and for exceeding permitted earthworks volumes; and under the Proposed and Operative Christchurch Replacement District Plans (the **PRDP** and the **RDP**) in respect of quarrying activities. At this point, we note that the status and some of the wording of the PRDP and the RDP have changed as a result of several decisions of the Independent Hearings Panel since the end of this hearing and during our deliberations. We return to this later.
22. Consent durations of 35 years are sought for the new resource consents sought from ECan and unlimited consent durations were sought for the new consents from CCC.
23. The Applicants formally amended the applications in a letter dated 12 April 2016. The amendments included the following:
- (i) Identification of a Quarry Fill Management Surface (**QFMS**);

⁴ In accordance with section 113(3) of the Act.

⁵ We note the Applicants use the term 'cleanfill'. We consider this term to be misnomer, with various conflicting definitions. We use the term 'back fill' material throughout this decision unless the term reflects what was said by one of the parties.

- (ii) Excavation to and below the QFMS provided there is a buffer of dry material above the groundwater table⁶;
 - (iii) Excavations that occur less than 1m from the groundwater surface (i.e. at Selwyn Quarries or McLeans Island) would occur using an excavator bucket operating from a platform that is at least 1m above groundwater level;
 - (iv) The deepening process would be staged, and deep excavation areas would be filled prior to opening new areas;
 - (v) Excavations could only occur below the QFMS if:
 - 1. There was adequate back fill material held on-site that meets the criteria for 'deep' and 'shallow' placement; and
 - 2. Back filling would occur prior to groundwater entering the excavation, as indicated by groundwater level monitoring;
 - (vi) Definitions for 'shallow' and 'deep' fill and a revised strategy for back filling which incorporated acceptance criteria, testing and reporting requirements for both types of fill; and
 - (vii) Revisions of the groundwater monitoring and testing regime.
24. Further amendments were made in the Applicants' written ROR, in relation to further revisions of the definition of 'deep' fill material and proposed monitoring and compliance procedures.

PRELIMINARY LEGAL ISSUES

Applications RMA92033380 and RMA92026181

25. The CCC s42A Report noted that that updated versions of Figures 2 and 3, provided by the Applicants in May 2016, differed to the notified applications. Accordingly, legal advice was sought from Brookfields Lawyers as to whether the amendment to add the Isaac Construction Company Limited's ('Isaacs') Stage 10 site was within the scope of the original applications, as notified.
26. Legal advice was also sought in relation to the Isaac's Dairy Farm Stage 9 site, following the discovery (after close of the submission period) that none of the existing resource consents held by Isaacs included quarrying of this site. The CCC s42A Report noted that further investigations had revealed that a separate application for quarrying at this site had been received in April 2015 (RMA92029369), but that this application had remained on hold for 10 months and had subsequently been granted on 9 May 2016.
27. Following advice from Council Officers, on 13 May 2016, the Applicants lodged an application to change the conditions of RMA92029369. This application is recorded as RMA92033380 and a determination is required as to whether this application can be integrated into the current hearing process.

⁶ At Miners Road the buffer must be greater than 1.0m. At Selwyn Quarries the buffer must be greater than 0.5m. At McLeans Island the buffer must be greater than 0.3m.

28. The legal advice received from Brookfields Lawyers addressed the matters raised by the CCC Reporting Officer and suggested an approach under section 39 of the Act enabling us to put all the issues 'on the table' and to integrate the separate applications into this hearing process.
29. On 26 May 2016, we issued Minute #2 to proceedings highlighting the preliminary legal matters raised and advised the parties that we would hear submissions in relation to the inclusion of applications RMA92033380 and RMA92026181 at the outset of the hearing. None of the hearing parties, except the Applicants and CCC indicated that they wished to be heard in relation to these matters.
30. The matters were addressed by Mr Chapman in his opening legal submissions. He noted that the Isaacs Dairy Farm Stage 9 site was included in the application maps and that it was clear from the application that deepening of this site was proposed. He considered the issue was a technical one only and that nothing turned on the fact that the application should have been for a new consent, rather than a variation.
31. In relation to the Isaacs Stage 10 site, Mr Chapman noted that while the site had not been included in the notified maps, an application to vary the resource consent (RMA92026181) had been included in the application, and that the legal description for the area was included in the AEE and the public notice. Again, he considered it was clear from the documentation that deepening of this area was proposed.
32. Mr Andrew Green of Brookfields Lawyers briefly appeared at the commencement of the hearing and confirmed agreement that the Isaacs Stages 9 and 10 sites could be appropriately dealt with in conjunction with the suite of applications sought.
33. Overall, we agree with Messrs Chapman and Green that applications RMA92033380 and RMA92026181 can be appropriately and fairly integrated into this decision making process. We accept that the assessment has been undertaken on the basis of the inclusion of these sites and that the environmental effects have been described and assessed. We note that no party wished to be heard and that no matters of prejudice or substance were raised in response to our Minute #2 or by the Reporting Officers. We therefore determine that applications RMA92033380 and RMA92026181 are included in our consideration of the applications subject to this decision, as set out in paragraph 18 above.

The Requirements for Discharge Permits

34. We raised a further legal matter during proceedings regarding the type of resource consents sought and relevant sections of the RMA that apply to the proposed activities. We noted that no discharge permits under section 15(1)(b) of the Act had been applied for from ECan and questioned whether the discharge of contaminants into and onto land, in circumstances where contaminants may enter water, could lawfully be authorised by a land use consent under section 9 of the RMA only.
35. ECan's Reporting Officers explained that the LWRP approached quarrying activity from a land use perspective and outlined the relevant rules in their Addendum. However, they

- agreed that on reflection discharge permits should have been required under section 15 and that both Land Use Consents and Discharge Permits should be issued if consent was granted. While they acknowledged the Applicants had not explicitly applied for consents under section 15, they accepted that the Applicants had assessed all the relevant effects for discharge permits to be issued. However, they noted that a section 105 assessment was required.
36. Given the wider potential implications of the advice given for ECan, and the views of the Applicants, we requested that the ECan Reporting Officers seek legal advice on the matter. This was provided by Wynn Williams Lawyers and was attached to the ECan Reporting Officer's memorandum dated 27 June 2016. In summary, the advice provided considered discharge permits were required pursuant to section 15(1)(b) of the Act and that the activity should be considered as a discretionary activity under the provisions of the LWRP.
37. We received further submissions on the matter from Mr Chapman in a memorandum dated 9 July 2016. He accepted the opinion provided by Wynn Williams Lawyers that discharge permits were required under section 15(1)(b), but made the following comments:
- (a) It has not been ECan's practice under the LWMP to require discharge permits;
 - (b) It is common ground that the nature of the activity has been clearly described and the effects evaluated;
 - (c) The redefinition of back fill material to remove material that is not 'inert' in nature, raises the question of whether there is a change in the physical and chemical properties of the receiving environment is a matter of fact; and
 - (d) The ECan legal opinion did not refer to the LWRP permitted activity rules for discharges (Rules 5.98 and 5.99).
38. At our request, ECan's Reporting Officers provided a further memorandum (dated 14 July) responding to the legal opinions and outlining the relevant provisions of the LWRP.
39. On the basis of the evidence presented, we consider discharge permits under section 15(1)(b) are clearly required to authorise the discharge a contaminant onto or into land, in circumstances where it may enter groundwater. We consider the past practice of ECan, to address the deposition of back fill as a land use activity, is not a relevant consideration. We are mindful that while these applications do not seek to discharge back fill material into standing groundwater, authorisation is sought to discharge back fill into the zone of groundwater fluctuation and therefore the fill material will, at unknown frequencies and durations, be directly into groundwater.
40. Despite claims by the Applicants that this is undertaken at some sites now under existing use rights (which we address later in our decision), we consider authorisation for this type of direct discharge into the groundwater zone is unprecedented in the region. We strongly disagree with Mr Chapman that the back fill material is wholly 'inert' material and consider the material clearly a 'contaminant' under the definition in the Act. We record we could only entertain the view of Mr Chapman if the back fill material was only 'virgin' aggregate from within the quarry site itself. We do not accept the discharge activity is permitted under the provisions of the LWRP.

41. Overall, we find that discharge permits are required to authorise the proposal. We are satisfied we have sufficient information to understand the nature of the proposed activities and to assess the actual and potential effects on the environment; and to undertake a section 105 analysis. We accept that discharge permits can be issued as part of this hearing process.

Scope of the Amendments

42. Mr Rodgers and Mr English, on behalf of the Water Rights Trust, raised concern that submitters had not been given the opportunity to comment on the amendments to the application prior to the hearing.
43. Ms Chapman addressed the concerns of the Water Rights Trust, noting that the amendments were as a result of the discussions between the experts to address adverse effects. She said that the recommended maximum depth of excavations and changes to fill definitions did not, in her view, increase any adverse effects. She noted that submitters had the opportunity to comment on the amendments during the hearing.
44. We accept that the amendments made were within the scope of the applications, as notified, and that these were intended to address adverse effects and concerns raised. We agree that submitters have had the opportunity to address the amendments at the hearing and that no party was prejudiced by allowing these.

NOTIFICATION AND SUBMISSIONS

45. The applications were jointly publicly notified on 21 November 2015 in 'The Press', 'The Star' and the 'Akaroa Mail'. A total of 614 submissions were received, with 508 submissions in opposition to all the applications and 105 submissions in opposition to one or more of the applications, but not all; four submissions were neutral to the entire proposal and 17 submissions were neutral to some of the applications, but not all; two submissions supported all the applications and seven supported some of the applications; and 136 submissions recorded they wished to be heard at a hearing.
46. The key issues raised in submissions were accurately summarised in the s42A Reports. We adopt these summaries and note that these matters broadly related to:
- (a) Groundwater effects;
 - (b) Ecological effects
 - (c) Cultural values;
 - (d) The extended duration of quarrying at Miners Road;
 - (e) Compliance with and enforcement of the conditions of existing consents;
 - (f) Precedent effects;
 - (g) The availability of gravel resources and alternatives;
 - (h) Effects on aviation; and
 - (i) Consistency with the statutory and planning framework.

THE HEARING

Applicants' Case

47. **Mr Ewan Chapman**, Counsel, conducted the Applicants' case, presenting legal submissions and calling twelve witnesses. He outlined the key issues relating to the applications for a combination of new resource consents and changes to conditions of existing resource consents to allow the Applicants to deepen and partially back fill existing quarries. He submitted that the Drinking Water Standards New Zealand (**DWSNZ**) set the appropriate benchmark for water quality and that the applications would maintain and protect at all times a potable water supply to Christchurch City. He noted the need to consider the level of certainty to demonstrate an effect, risk parameters and assessment, and efficiency of resource use.
48. Mr Chapman outlined the amendments to the applications and addressed the status of the applications, bundling of the applications across regional and district council plans, the existing environment, environmental effects, precedent, positive effects, objectives and policies, alternatives, the s42A Reports, and conditions. Appended to his legal submissions were draft conditions for the new consents, a draft '*Quarry Deepening Environmental Management Plan*' dated June 2016, a copy of Winstone Aggregates Resource Consent CRC160067, and a copy of the Environment Court's decision in relation to Three Kings Quarry (*Decision No. [2011] NZ EnvC 130*). At our request, Mr Chapman provided us with a one page summary of the recent enforcement action taken by ECan against Winstone for breaching excavation depths and an excerpt from ECan's decision regarding the granting of Central Plains Water (**CPW**) irrigation scheme resource consents.
49. **Mr Jason Blair**, a 3D Visualisation Specialist for Virtual View Limited, attended the hearing to show a computer generated 3D video simulation of the proposed quarry deepening and back filling process.
50. **Mr Brian Warren**, a consultant to the construction industry and previously Chief Executive of Isaac Construction Limited, gave a statement on behalf of the CAPG and background into the formation of the group in 2008, when the CCC commenced a study into the availability of land for quarrying and later the formal review of the District Plan. He outlined concern with the uncertainty of the current limit of excavation depth to 1m above HRGL, given the variability of groundwater levels and the long periods that elapse between higher levels. He considered this could result in leaving considerable volumes of gravel in the ground and that any increase in HRGL would reduce extraction depths. He noted this was particularly a concern given the predicted increases in groundwater level predicted by implementation of the CPW irrigation scheme.
51. Mr Warren acknowledged that collectively the consented quarries were estimated to satisfy the region's demand for over 30 years, but that supply close to the area of demand is of significant benefit to the community. He outlined alternatives to providing additional resource, but noted new land-based areas take time to establish and require the construction of plant and associated infrastructure, and would be further away from the

- largest area of demand. He estimated the applications would generate 20-30 million tonnes across all sites.
52. Mr Warren emphasised the key points of the proposal were no exposure of groundwater, strict monitoring, no surface water ponding, stockpiling of sufficient quantities of pre-approved back fill prior to excavation, no increase of environmental effects, appropriate spill management procedures, and progressive rehabilitation.
 53. Mr Warren noted that while individual consents would be granted for each site with a common clause for excavation depths, each site would retain all of their existing conditions. He confirmed the Applicants' commitment to the conditions proposed.
 54. In response to questions, Mr Warren acknowledged that the availability of 'deep' fill would be critical to enabling deepening excavations to occur. He considered that the majority of the sites at Miners Road would be 'there forever' because the gravel resource was good, demand was close and that material has been imported to these sites from other sites for years. He noted that nothing determined restored ground level and acknowledged that the applications would result in lower final ground levels, due to the shortage of suitable back fill material.
 55. **Mr Michael Copeland**, a Consulting Economist and Managing Director with Brown, Copeland and Company Limited, presented a statement of evidence assessing the economic effects of the applications. He outlined the relevance of economic effects under the RMA, the future demand for and supply of aggregate in greater Christchurch, the economic importance of low cost aggregate supplies, the economic benefits of maintaining Christchurch's aggregate supply cost advantage, the economic benefits of deeper quarries, and issues raised in submissions and the s42A Reports.
 56. In summary, Mr Copeland concluded that the applications would enable people and communities to provide for their economic well-being, and for the efficient use and development of natural and physical resources. He noted that net financial benefits for the Applicants of the proposal were not directly relevant to the assessment of effects under the RMA and that the focus was on the wider economic effects on other parties, which are referred to as externalities.
 57. **Mr Peter Savage**, Environment and Resource Development Manager for Fulton Hogan Limited, gave evidence outlining Fulton Hogan's activities at Miners Road and McLeans Island. He noted that the relatively new sites operated under the protocols for cleanfill management developed by the Ministry for the Environment (**MfE**) and adopted by the two CCC bylaws. He advised that the company's primary 'cleanfill' operation was at Pound Road (which is not subject to this application) and that extensive monitoring data indicated direct effects downstream of the site.
 58. Mr Savage outlined the importance of the aggregate industry to Christchurch and sustainable management of communities, and that proximity to demand was a key aspect given that transportation costs are often the biggest determinant of the end price of the aggregates. He considered that the consenting of new quarries was problematic given proximity to neighbours and proximity to demand. He confirmed that the excavation

methods proposed for deepening were consistent with current methods used at Miners Road and outlined that changes in the operating procedures for the receipt and management of back fill for under the consents sought.

59. In response to questions, Mr Savage advised that the Miners Road asphalt plant would continue regardless of whether the *in-situ* resource is depleted. He estimated that Fulton Hogan had 10-12 years of aggregate resource at Miners Road (at current extraction rates) and 10-12 years at McLeans Island, and that deepening would extend this by approximately 6 years and 4-5 years respectively. He advised that 1-2 trucks of 'cleanfill' were turned away every week, out of hundreds of truckloads per week.
60. **Mr Lindsay Forbes**, Canterbury Manager for Road Metal Limited, gave evidence outlining the receipt and inspection of 'cleanfill' and commenting on the s42A Reports. He noted that most of the current 'cleanfill' received is inert material from site excavations, subdivision development and roading construction, including asphalt and concrete. He advised there had been a 30 percent increase in the volume of 'cleanfill' material and that this also included earthquake demolition material, such as brick and concrete rubble. He outlined the current cleanfill management procedures and estimated two truck loads per year were rejected out of approximately 8,000 truck loads (or 100,000 tonnes per year) based on records kept since 2008. He noted that there were two other sources of back fill material for 'deep' fill from within the Road Metals quarry site, which were from a silt layer present and by-product pea gravels. He disputed that there was any lack of compliance with existing consent conditions at Road Metals Ltd's quarries.
61. **Ms Andrea Cave**, Environment Manager for Winstone Aggregates, gave oral evidence in relation to procedures for back fill material from Hazardous Goods and Industrial List (**HAIL**) sites, concrete slurry disposal and 'cleanfill' material as defined by their existing consent (including plaster board material). She estimated the life of the existing quarry at Miners Road was five years and that the proposal would increase this by a further five years. She explained how the abatement notice served in relation to breaches in excavation depths were as a result of differences of opinion in defining HRGL.
62. **Mr Tim McMorran**, Principal Engineering Geologist for Golder Associates (NZ) Ltd, presented rebuttal evidence in relation to the evidence of Mr McCracken on behalf of the Regional Engineer for ECan. He addressed the setback distance from the toe of flood embankments to mitigate potential slope instability, stability analyses undertaken and internal erosion.
63. **Mr Neil Thomas**, a Hydrogeologist for Pattle Delamore Partners Ltd, presented evidence covering the hydrogeological setting for the three quarry sites, the effects of the existing quarrying activities, potential effects of the proposed deepening, and issues raised in submissions and the s42A Reports. He concluded that available monitoring data indicated there were some effects on downgradient groundwater quality as a result of existing quarrying activities, but that these were localised effects on some general water quality parameters including alkalinity, electrical conductivity and hardness, and were not of concern to human health. He considered any effects on groundwater quality from the proposal, where back filled material would be inundated 'from time to time', would be expected to be minor and localised, and would only affect aesthetic groundwater quality

- parameters. He expected that no widespread effects on the Christchurch groundwater system would occur.
64. Mr Thomas noted that numerical simulation of the risks of the 'worst case scenario' undertaken by Council advisors indicated faecal contamination up to 300m down gradient, if any exposed groundwater occurred in the pits for more than a period of several weeks; fuel spill contamination of up to 150m, if an unsaturated buffer zone was not maintained under the excavations; and increases in hardness over a distance of 500m, from the currently consented disposal of concrete slurry. He considered effects on downgradient water quality would be small and should not affect domestic bores provided that the potential for exposed groundwater is avoided and the back fill is controlled and tested.
65. In terms of existing groundwater quality, Mr Thomas noted that at McLeans Island there was a long term rising trend (since 2003) in the concentrations of alkalinity, electrical conductivity and hardness, but that these concentrations were low. He suggested this long term trend was likely to relate to lower groundwater levels and less dilution. He also noted that short term fluctuations in water quality parameter concentrations in downgradient bores may reflect impacts from current quarry activities, correlating with rainfall recharge moving through the existing back fill material. At Miners Road, he noted a pattern of elevated water quality parameters within and downgradient of the quarries, and correlation between concentration fluctuations and groundwater levels (caused by increased rainfall infiltration), with pulses of recharge moving through existing back fill material. He highlighted that variation in water quality parameter concentrations downgradient of the Winstones quarry (where the disposal of concrete slurry is consented) was greater than downgradient of the other quarries, with much higher 'spikes' associated with rainfall. He noted that there was no groundwater quality data available for Selwyn Quarries.
66. Mr Thomas emphasised that while the available data indicated increases in the concentration of hardness in the bores downgradient of the McLeans Island quarries, these concentrations were below the DWSNZ limits and were unlikely to cause adverse effects on downgradient groundwater users. At Miners Road, he noted that modelling (using compliance monitoring data) indicated the effects from existing back fill concentrations of hardness would be expected to reduce to below the DWSNZ within approximately 100m downgradient of the edge of the quarries and were likely to be limited to shallow depths.
67. In relation to potential changes in groundwater levels, Mr Thomas concluded that the proposal would have limited effects on the overall pattern of groundwater movement, with drawdown effects of more than 0.1m, extending no more than 100m downstream and mounding effects of more than 0.1m extending no more than 100m upstream. While he noted this could have some effect on springs and streams within 100m of the proposed deepening areas, he considered it was important to consider these effects within the context of the general variations in groundwater levels.

68. In response to questions, Mr Thomas stated that the existing groundwater quality effects at Miners Road were likely to be from a combination of both historical back fill activities and the disposal of concrete slurry.
69. **Mr Peter Callander**, a Senior Hydrogeologist with Pattle Delamore Partners Ltd (PDP), presented a statement of evidence outlining the background to the applications, the proposed approach to managing the deeper excavations and information regarding the risk posed to the groundwater resource. He noted that the applications had been made in response to the possible rise in groundwater levels caused by the CPW scheme and the need for aggregate supply. He considered the proposed regime for deeper excavations would not increase exposure of groundwater as suitable fill material would be stockpiled onsite to back fill the excavations if groundwater levels were to rise. He was of the view that the management, monitoring and mitigation proposed was an improvement on the existing variable requirements across the quarry sites. While he accepted the proposal could increase the risk of groundwater quality impacts, he noted that no adverse effects were anticipated, and that a rigorous evaluation and testing regime was required when the back fill included demolition material or material from a potentially contaminated site.
70. Mr Callander outlined the following key criteria for the management of deeper excavations and discussed:
- (i) The definition of a QFMS for each area;
 - (ii) Maintaining a separation between the excavation surface and groundwater;
 - (iii) The definition of acceptable back fill material and availability of suitable material;
 - (iv) Monitoring of groundwater quality;
 - (v) Mitigation measures.
71. Mr Callander described the current range of definitions limiting excavations and noted that the QFMS proposed were based on the lowest excavation depth currently authorised at each of the areas. He outlined that the proposed separation distances reflected the annual range of groundwater fluctuations that occur at each of the areas. He discussed the level of risk associated with different types of 'deep' fill material and the risk posed by infrequent inundation of 'shallow' fill at times of high groundwater levels. He concluded that if the fill was placed, as he described, he would not expect any changes in groundwater quality over and above the pattern of changes already occurring. He considered any risk of contamination from material that does not meet the fill criteria was 'acceptably low', excluding materials from potentially contaminated land.
72. In considering contamination risks to groundwater, Mr Callander discussed the groundwater effects of the former Waimairi County Council landfill site, the disposal pits at the former Islington Freezing Works site and the former Papanui County Council landfill. He noted these historic land uses had significantly more potential for contamination of groundwater, but that groundwater monitoring indicated no effect 200-500m downgradient due to the *'rapid and dispersive characteristics of groundwater flow through the heterogeneous alluvial aquifer deposits'* (p.17).
73. Mr Callander emphasised that the existing fill material had a greater contamination potential than the proposed activities due to the fact that it had historically been poorly

controlled, some had been placed below the HRGL, and a wide range of material had been included. He noted that these existing effects would continue irrespective of these applications and that it was any change that was important. On the basis of existing groundwater quality data at Miners Road, he expected that no noteworthy change in groundwater quality in wells deeper than 60m or further than 1km downgradient would occur. Overall, he concluded there would be no widespread adverse effects that would threaten water supplies and that any effects would be *'small scale limited effects in shallow groundwater that would not affect neighbouring well users'* (p.20).

74. In response to questions, Mr Callander considered the sensitivity of the receiving environment was low due to the resilience of the groundwater system and that this fact had not been acknowledged by submitters. He also agreed with Mr Thomas that existing groundwater effects were likely to be from a combination of existing back filling activities and concrete slurry disposal.
75. **Dr Wayne Temple**, a consultant Toxicologist, presented a statement of evidence focussing on the possible changes to the chemical determinants in drinking water and their significance to human health based on a review of the PDP reports. He outlined background to the DWSNZ and World Health Organisation (**WHO**) guidelines. He discussed maximum acceptable values (**MAVs**) and guideline values (**GVs**) and their relationship to health risks, noting that short term exposure to levels exceeding MAV were not a cause for concern given the limits are based on a lifetime of exposure. He noted that exceeding the aesthetic GV for a short period would not necessarily render the water unacceptable, and that increases in hardness into the range of 100-200 micrograms per litre (**mg/L**) would actually make the groundwater more compliant with the DWSNZ. Overall, on the basis of the PDP analysis, he did not expect any potential effects on public health from elevated chemical determinants in drinking water.
76. **Dr Marks Sanders**, an Ecologist and Director with Ryder Consulting Ltd, presented a statement of evidence in relation to increased bird strike risk from the deepening proposal. Overall, he considered the likelihood of birds being attracted to the quarry sites as a result of the proposal was low because groundwater would not be exposed and no additional water bodies would be created. He considered the proposed conditions of consent were sufficient to avoid long term ponding of water (more than 48 hours) and that any temporary ponding would only result in the re-distribution of local birds, and not any net increase in local bird populations.
77. **Mr Kevin Bligh**, a Senior Planner with Golder Associates (NZ) Ltd, presented a statement of evidence addressing the resource consents applied for, the permitted baseline and existing environment, environmental effects and positive effects, statutory considerations, submissions, and possible conditions. In summary, he considered that the non-complying activities (CCC new resource consents) passed through both 'gateway tests' of section 104D, and that as a whole, the proposal had significant positive effects. He considered that any adverse effects of the proposal would be avoided, remedied or mitigated to levels which are minor or less than minor, and that these measures had been reflected in the suggested consent conditions.

78. In addition to the environmental effects addressed by other witnesses, Mr Bligh addressed effects on cultural values and cumulative effects. He noted that a Cultural Impact Assessment (CIA) had been sought by the Applicants, but that the Rūnanga preferred to present evidence on the applications and were opposed to the applications in principle based on potential water contamination. He concluded that any adverse effects could be appropriately avoided or mitigated by implementation of the mitigation measures proposed. In relation to cumulative effects, he noted the areas to be deepened were only a small component of quarrying activity and that the effects of the activity are similar regardless of the number of individual sites applied for.

Submitters

79. **Mr Brent Pizzey**, Counsel, presented legal submissions on behalf of the CCC as a submitter in opposition to the applications and called three witnesses. Mr Pizzey explained the context of the submission by CCC in its role as a provider of drinking water supplies and obligations under the Local Government Act 2002. He emphasised the special nature of the groundwater resource and the potential for the proposed activities located in the headwaters of the city aquifer system to contaminate a pristine water supply. He outlined that the submitter's primary concern was that the proposed conditions do not provide adequate protection of drinking water supplies and that the statutory instruments reinforce the importance of avoiding adverse effects on this important resource.
80. Mr Pizzey submitted that where there was a risk of serious or irreversible harm to the environment coupled with scientific uncertainty, as to the extent of that risk, then decision makers should be cautious. In this case, he considered that any contamination of the pristine groundwater resource is serious harm and that there is scientific uncertainty about the likelihood of it occurring. He submitted that the Applicants' case relied on consent conditions to provide assurance that the proposed 'adaptive management approach' would sufficiently reduce uncertainty and adequately manage the risks, and that there was no evidential basis to this assurance. He agreed with Mr Chapman's submissions with regard to the five steps for assessing risk, but that the prior step was to analyse the relevant principles, objectives and policies to prevent conducting risk assessment in a vacuum. In this case, he submitted the context included very specific, very precise objectives and policies to avoid risks to water quality.
81. Overall, Mr Pizzey concluded the applications posed too great a risk and provided too few safeguards, and that the conditions proposed are not adaptive management. He noted that care should be taken to ensure that Part 2 considerations are not applied in a manner that dilutes the clear and strong imperative in the operative statutory documents that seek to protect groundwater from contamination.
82. In response to questions, Mr Pizzey considered the DWSNZ should be considered to be an environmental bottom line, but that the relevant policies say that any impact on such an important pristine resource is too much and it is not just about potable water. He submitted that there is clear evidence that there will be adverse effects and that the threshold for 'tolerable effects' must be higher given the relevant objectives and policies

83. **Mr Michael Bourke**, Senior Technician in CCC's Asset Planning – Water and Wastewater team, gave statement of evidence describing the water supply for Christchurch city, CCC's responsibilities as a drinking water supplier, and the consequences of compromised groundwater quality. He highlighted that the existing high quality of the groundwater obviated the need for treatment (other than UV treatment in the north west of the city) and the significant capital costs (approximately \$340 million) if treatment was required to remove contaminants. He considered that the back filling of material posed a risk to the resource and that any cost to treat drinking water would be borne by the ratepayers of Christchurch, which was socially and financially unacceptable. He noted that a 2004 report estimated the value of Christchurch's West Melton groundwater at over \$2,000 million per year.
84. Mr Bourke provided a map showing the location of 25 shallow wells in the unconfined aquifer area in the North West water supply zone, which were closest to the quarries and were considered to be at risk from contamination. He noted a programme to replace these shallow wells was underway with completion by June 2018. He acknowledged the benefits of an accessible and affordable aggregate resource, but emphasised there were other sources that were not close to groundwater and the city's water supply wells. He also considered that future growth of Christchurch would move closer to the quarries. He noted uncertainties around groundwater levels in the longer term and potential legacy issues if 'shallow' fill is saturated in the future. He considered that any variation from the management of the fill could have significant and long term implications for groundwater quality, which would be difficult to remediate.
85. In the event that the applications were granted, Mr Bourke considered it should be on the condition that no contaminated material would ever be likely to come into contact with groundwater and that HAIL site material is removed from the list of acceptable material, regardless of testing.
86. **Dr Lee Burberry**, a Senior Groundwater Scientist with the Institute of Environmental Science and Research (ESR), presented a statement of evidence on behalf of CCC and Christchurch International Airport Limited (**CIAL**). His evidence described the hydrogeological setting and the position of CCC and CIAL potable public water supply wells in relation to the quarries, contamination risks, risks from filling activities, the appropriateness of the QFMS, and the definition of acceptable cleanfill, particularly 'deep' fill. He noted that groundwater in the unconfined aquifer recharge zone was fast flowing, providing significant dilution/flushing potential for pollutants, but that this meant effects would be felt quickly. He considered the heterogeneous nature of the aquifer, in terms of hydraulic connectivity and channelisation, which promoted preferential flow and transport, posed an issue to design effective defensive or investigative groundwater monitoring around a point source pollution source.
87. Dr Burberry considered it was the back filling with exogenous material, that would be placed below the water table, that presented the greatest uncertainty in terms of predictive outcome and perceived risk to long term groundwater quality. He highlighted that existing quarrying and back filling changed groundwater chemistry, noting breaches in MAVs for bacterial numbers and aesthetic determinands (iron, manganese, aluminium

and hardness) recorded above DWSNZ. He considered that while aesthetic determinants are not a health risk, changes to them are material effects. He expected further chemical changes if fill material is placed deeper, noting the precise magnitude of the impacts was uncertain.

88. Dr Burberry emphasised that the effectiveness of the waste acceptance criteria (**WAC**) was critical to the proposal, and that excluding all vegetative matter would reduce the likelihood of redox⁷ changes; and that not placing fill below the highest water table would equally mitigate these effects. He considered the proposed QFMS was not a conservative estimate of the HRGL at either McLeans Island or Miners Road, and that periodic saturation with groundwater would promote chemical leaching and an increase in the water quality impacts detected to date. He considered that accepting 'deep' fill with up to 2 percent vegetative matter translates to significant increase in vegetative material below the water table, which could alter redox conditions and could conceivably mobilise metal compounds. He noted that rapid elevations in groundwater could occur and that groundwater may well become exposed in the deepened excavations. He considered that while the risk to the CCC and CIAL wells may be small, it hinged on strict controls and adherence to definitions of 'deep' and 'shallow' fill.
89. In response to questions, Dr Burberry considered the proposal would have a compounding effect; and urged caution with monitoring results given the location of some of the monitoring wells, uncertainties around preferential flow paths, and recent exceptionally dry periods and low groundwater levels.
90. **Ms Anna Mackenzie**, a Senior Planner with Avanzar Consulting Ltd, presented a statement of evidence on behalf of CCC and CIAL. Her evidence addressed the actual and potential effects of the proposal, consideration of the statutory framework, and commented on the effectiveness of the proposed conditions. She highlighted that suitable back fill material was in short supply and that the Applicants' definition of 'cleanfill' material differed to what CCC considers is acceptable. She noted concern regarding timeframes to respond to any changes in water quality in monitoring wells, the duration of consent sought, and the irreversible nature of any adverse effects.
91. Overall, Ms Mackenzie concluded that the adverse effects of the proposal were more than minor and that the proposal was not consistent with the relevant statutory framework.
92. **Ms Jane Demeter** provided written statement in addition to her written submission in opposition to all of the applications. Ms Demeter emphasised the risk to the existing high quality of the groundwater resource and potential contamination. She highlighted that the area was considered so important that its protection had been addressed by a Variation 6 to the Natural Resources Regional Plan (NRRP), which was still operative when the applications were lodged. She noted that there were alternatives available for aggregate supply that do not pose any risk to drinking water supplies and that the risks to the city from this proposal were too great. She highlighted uncertainty regarding the effect on critical biofilms and stygofauna that assist with purifying water. She noted that

⁷ Oxidation-reduction reactions

climate change would accentuate the risks and uncertainties of the proposal. While she suggested a shorter consent duration, she acknowledged that this would put more pressure to accept 'cleanfill' material that may not meet strict criteria, given that the availability of suitable material was a key limiting factor. She stated that to consider that potential adverse effects can be mitigated by consent conditions 'was a stretch'. She considered far more rigorous conditions would be required to protect groundwater quality and questioned the consent authorities' ability to adequately monitor and enforce consent conditions given past performance. She urged us to consider that 'when in doubt, don't'.

93. **Mrs Leigh Thornton**, provide an additional written statement and spoke on behalf of herself and her husband, Mr Barry Thornton, Ms Jenna Thornton and Ms Laura Hatwell (occupiers of 25 Jessons Road), and Ms Carol Hayton and Ms Sandra Redmond (87 Jessons Road), all of whom were in opposition to the applications. Ms Thornton explained that almost their entire property was within the 300m so called 'buffer zone' of the Isaac dairy farm site and that they have three wells in close proximity to the quarry site boundary. She considered it was more accurately described as the 'likely contamination zone', going by the PDP reports. She noted that two of their wells had been omitted by the Applicants and showed us the location of these on a map. In addition to concerns regarding water quality, she noted that the water level in their wells had dropped over two metres over 30 years.
94. Ms Thornton considered that no amount of monitoring would avoid contamination and that well testing would not be frequent enough to give them confidence that their water would continue to be safe to drink. She noted they would rather have mitigation up front (i.e. deepening of their wells) rather than facing the uncertainty of monitoring and having to prove an adverse effect linked to the proposal. She outlined that the existing consents had been processed on a non-notified basis by CCC and that they had been unable to voice concern regarding adverse impacts from dust, noise, traffic and visual effects. Overall, she considered that Applicants had not made a convincing case for the proposal, given the risks posed to their drinking water supplies.
95. **Mr Shaun McCracken**, a Senior River Engineer for ECan, presented evidence on behalf of the ECan's Regional Engineer. His evidence described the significance of the Waimakariri River flood protection infrastructure, the risk of excavating too close to the existing stopbanks, and details of risk mitigation that would protect the existing stopbanks. Mr McCracken outlined the amendments required to meet the Regional Engineer's concerns and referred to a cross section diagram showing the required separation from existing stopbanks appended to his evidence as Figure 1. He also noted that the Applicants had failed to show the stopbanks to the north of the site and that Figure 3 appended to his evidence was accurate.
96. **Mr Brandon Hutchison** provided a written statement in opposition to the applications and called Dr Dudley Ward to give expert evidence on his behalf. Mr Hutchison is a landowner (405 Old West Coast Road) with a groundwater bore approximately 300m upgradient of the quarry boundary. He was concerned about the effects on groundwater quality, and on groundwater flows and well water levels from the proposal. He was alarmed that

historic back filling had not been strictly controlled and considered this was indicative of the 'cowboy culture' of the quarries. He questioned the suggested doubling of the cost of aggregate for every 30km travelled and considered the monitoring proposed was inadequate.

97. **Dr Nicholas Dudley Ward**, a Senior Lecturer in civil engineering at the University of Canterbury, provided a written statement on the groundwater modelling undertaken by PDP for the Applicants. He emphasised the uncertainty inherent in undertaking such simplistic modelling and the lack of any sensitivity testing. In cases such as this, where there is limited data and highly variable aquifer structure, he considered that sensitivity testing would reveal large uncertainties. He urged caution in relying on such unreliable assessments and considered these provided qualitative rather than quantitative guidance. He noted that assessments based on simple homogenous models with made up parameters have, at best qualitative merit and, at worst, are misleading.
98. Dr Dudley Ward emphasised that contaminant transport in aquifers is difficult to quantify with precision and that there was great deal we do not understand about the likely long term effects, except that it was non-negligible. He considered exposing our groundwater to such risks underestimated its future value. In response to questions, he considered the contaminant dispersion modelling was not conservative, as suggested by the Applicants, and that quantifying any effects with any certainty was very difficult.
99. **Mr Evan Smith** provided a written statement in opposition to the applications. He strongly opposed the proposed deepening due to the significant risk to groundwater within the recharge zone. He emphasised that the Applicants had not demonstrated, with any certainty, that existing groundwater quality would not be compromised. He considered that existing monitoring was woefully inadequate, potential effects would be irreversible, and there was inadequate supply of suitable material for back filling, particularly given the demand for such material at Port Lyttelton. He urged us to take any risks seriously and that these should be avoided at all costs.
100. **Ms Nicola MacLean** spoke to her submission in opposition to the applications. She was concerned about contamination of groundwater and the irreversible nature of any potential effects. She has a well downgradient of the Winstone site and was particularly concerned about protection of existing drinking water quality. She was concerned about reliance on the quarries self-monitoring compliance with consent conditions and lack of enforcement by the consent authorities.
101. **Mr Jim Turpin** provided additional written submissions in opposition to the applications. He noted he was pleased to see the Council Officers' recommendations to decline the applications and considered it was clear that the proposal posed significant risk to groundwater for little benefit, except for short term financial gains for quarry owners. He noted the evidence indicated that there would be no shortfall in aggregate supply by 2041 (given the margin of error and new consents) and that the claim of double cost for every additional 30 km of transportation can't possibly be true given competition in the market and the fact that aggregate is already coming from outside CCC boundaries. He urged us to ensure that common sense prevailed and the applications be declined.

102. **Mr Ian Scott** spoke to his submission in opposition to the applications. He considered the risk to groundwater increased with increasing depth of excavations. He was concerned that back filling cannot replicate natural substrate form and composition, and that groundwater flows would be altered by removing non-permeable layers. He noted there were too many uncertainties and highlighted that the Greendale fault was unknown prior to the earthquakes.
103. **Ms Cathy Smith** spoke to her submission in opposition to the applications. She emphasised the importance of protecting existing groundwater quality and local drinking water supplies. She noted there were alternative supplies of aggregate further away from sensitive drinking water supplies and that if necessary aggregate could be transported by train to reduce adverse effects. She considered the quarries could not be trusted to comply with consent conditions based on their past performance, and referred to an article from the Press (11 June 2016) that confirmed the industry had been slow to meet environmental standards.
104. **Mr Mike Mora** provided a written statement in opposition to the applications, noting his 24 years of experience in local government and his support for the CCC's submission in opposition. He was concerned about the risks to groundwater quality and the significant cost to the community (ratepayers) if drinking water supplies were adversely affected. He highlighted the ongoing concerns of the Yaldhurst community regarding adverse effects from the existing quarries and urged us to look closely at the history of non-compliance with existing consent conditions and lack of enforcement by both CCC and ECan. He considered that Miners Road shows that it is the neighbours who end up monitoring adverse effects. He noted that the Applicants' assessments relied on strict compliance and enforcement, and he had no confidence in the operators' and Councils' ability to ensure this is undertaken without fail. He considered the back fill material could not provide for protection of groundwater quality like an undisturbed layer does. He referred to the Owaka pit, the ongoing legacy issues with groundwater contamination and CCC's lack of action regarding remediation, as an example of the difficulties in dealing with long term contamination. He emphasised that climate change, sea level rise and the CPW irrigation scheme added significant uncertainty to future groundwater levels.
105. **Mr Murray Rodgers** provided a written statement in opposition to the applications by the **Water Rights Trust** and called Mr English as an expert witness. Mr Rodgers considered the applications reflected the dominance of short term economic gain, over protection of existing environmental quality. He noted that if the applications were granted the community would be put at risk for no good cause. He was concerned that people had not had the opportunity to comment on the amendments to the applications and that this provided a basis for legal challenge to the current process. He emphasised that Christchurch's water is highly valued by its citizens providing enormous social and economic value, and that the number of submissions in opposition reinforced this.
106. Mr Rodgers noted that the proposal involved depositing potentially contaminated materials directly into the aquifer, and that it was contrary to good environmental practice and the protection afforded to other water catchments. He concluded that the

evidence of Mr English demonstrated that the Applicants had failed to identify, quantify or manage the contamination risks inherent in the proposal. In response to questions, he noted the decline in surface water quality over the last ten years and connection between groundwater and springs which feed our lowland streams.

107. **Mr Richard English**, a consulting Engineer with Twelfth Knight Consulting, presented a brief of evidence on behalf of the Water Rights Trust and emphasised his experience and knowledge in the aggregate resource and cleanfilling (including the CCC's Cleanfill Bylaw) and the hydrology of the Christchurch – West Melton aquifer. Mr English's evidence outlined background to the proposal (including demand for aggregate, cleanfilling quantities, types and current practice, and contaminant leaching), operational issues, alternatives, comparative economics, and conclusions. He presented an extensive Powerpoint presentation.
108. Mr English concluded there were more than adequate resources already consented to meet demand generated by the earthquakes and that any shortfall in supply in the medium to long term (through to 2041) could be met by new quarries. He considered that any lifetime increased cost of alternative sources would amount to less than 5 percent of the delivered price and that this was less than the value of one year's value of the Christchurch potable water supply.
109. Mr English noted that cleanfill return rates were equivalent to approximately 25 percent of overall land based aggregate production and that the ratio would remain similar to pre-earthquake levels. Although he noted that waste minimisation, recycling and stricter cleanfill standards could lead to a reduction in the return rate to approximately 15 percent. He considered the Applicants had failed to recognise this potential dearth in the supply of suitable back filling material. He calculated that on the assumption that all current materials are suitable, the average time to excavate and back fill could be 25 to 30 years. However, assuming one third of current cleanfill material would not be acceptable as deep fill the timescales extend to 35 to 40 years for completion.
110. Mr English discussed the production of leachate and the mechanisms controlling the release of contaminants in specific situations and need to understand this before the information is used to model the impacts of leachate on the local environment. He suggested that alternative testing regimes such as Leaching Environmental Assessment Framework (**LEAF**) should be used to provide a more accurate predictor of leaching, but that the Applicants had failed to provide any data on potential contaminants. He considered that monitoring data suggested that despite the presence of potential contaminants in historical back fill, contamination is generally absent due to low volumes of rainwater percolating through the fills (i.e. a transport mechanism) and limited ability to transport small particulate or dissolved contaminants through the fill into the aquifers (i.e. a pathway). He noted that the undisturbed gravels beneath the fill were sufficiently dense to ensure most dissolved material cannot pass and therefore a pathway does not exist. He highlighted that the proposal significantly changed this environment by periodic inundation of the fill material and groundwater flowing through, and therefore significantly increased potential for contamination. He noted that this increase in risk had not been quantified by the Applicant in any meaningful way.

111. While Mr English acknowledged the Applicants revised WAC for 'deep' fill, he considered the assessments failed to address underlying issues relating to leaching and contamination and the concept of 'inertness'. He suggested the Applicants should develop physical, chemical and biological WAC which clearly delineated maximum permissible concentrations of compounds, to ensure there are no impacts on human health and local aquifer systems.
112. Mr English noted that no information had been provided on the impact of the amendment to follow groundwater down in terms of the aggregate available or volumes of back fill required. He considered the applications were 'cherry picking' conditions from existing consents and that the existing consents do not reflect modern understanding of environmental protection. He recommended the current consents should be extinguished, and consistent and enforceable conditions imposed in line with modern practice.
113. Overall, Mr English concluded that the applications were uncertain and were based on potentially incorrect assumptions; do not recognise the ramifications of limited suitable back fill material; provide no evidence on potential contaminants in the back fill; provide no evidence on any economic gains that outweigh the potential risks to drinking water supplies; and ignore economically viable alternative aggregate supplies.
114. In response to questions, Mr English stated that he had previously supported excavations and back filling to 1m above HRGL, because there was no contaminant transport route. However, he considered this proposal was different, as it would create a direct transport route and was a 'step too far' in terms of risks to groundwater quality, which could result in dramatic changes. He stated that, in his view, concrete slurry should not be discharged into land due to the transport mechanism of the water and should instead be recycled.
115. **Ms Annabelle McKenzie** provided a written statement in opposition to the applications. She explained she had a property at 540 Pound Road, with a shallow groundwater bore. She noted the increased development on the west side of the city and the reliance on bores for drinking water. She highlighted significant fluctuations in groundwater levels and considered this was the reason for the 1m buffer. She considered the risks of the proposal were too great and absolutely unacceptable. She noted that the costs of aggregate supply from other sources had been exaggerated and that moving away from the airport would lessen restrictions on subsequent land uses.
116. **Mr Ben Williams**, Counsel for **Christchurch International Airport Limited (CIAL)**, presented legal submissions and called two witnesses. One of these witnesses was Dr Burbery, who appeared earlier in the hearing on behalf of both CCC and CIAL. Mr Williams gave an overview of the issues of relevance to CIAL, and submitted that any groundwater contamination would be an adverse effect and potentially one of low probability, but high potential impact. On the basis of the evidence, he submitted it was clear that localised effects of existing quarrying would be exacerbated by the proposal; the certainty of any risk to long term groundwater quality would depend on the management of fill quality; and that DWSNZ were unlikely to be exceeded, but aesthetic effects would occur.

117. Mr Williams noted that the applications relied on ‘all going to plan’ and the view that any aesthetic effects on local drinking would be acceptable. However, he pointed out Regulation 7 of the Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 (**NES Drinking Water**) prevents the grant of a discharge permit if the activity is likely to increase the concentration of any aesthetic determinand to levels exceeding the guidelines values. He submitted that if ‘all doesn’t go to plan’ potential effects would be very complex and would depend on a number of variables (such as groundwater levels), some of which are outside the control of the Applicants. He emphasised that even unintended non-compliance (e.g. contamination from untested material that was thought to be clean) could have a significant adverse effects and that these consequences must be considered. He submitted that bird strike risk could be addressed through the imposition of appropriate conditions.
118. Mr Williams emphasised Objective A2 of the National Policy Statement for Freshwater Management 2014 (**NPS Freshwater**) and the overarching requirement that *‘the overall quality of fresh water within a region is maintained or improved’*. Overall, he submitted that it was CIAL’s position that the applications are contrary to the objectives and policies of the proposed City Plan and were most likely contrary to the LWRP, and would have adverse effects that are more than minor. Even if it was considered that the applications passed section 104D, he considered the applications should be declined due to lack of details, uncertainty and the consequences of potential effects on drinking water supplies. In the event that consents were granted, Mr Williams outlined a number additional conditions that CIAL would seek to have imposed.
119. **Ms Katherine McKenzie**, Senior Planner – Land Use with CIAL, gave a statement of evidence addressing an overview of the operations of CIAL, an overview of CIAL’s submission, the risk of water contamination, and bird strike risk. She outlined the three wells operated by CIAL for potable (untreated) water supply, the risk posed to these wells by the proposal, and effects on the aesthetic quality of the water supplied. She highlighted concern that the proposed QFMS would allow material which only meets the ‘shallow’ fill criteria to be placed below the HRGL, risking leaching contaminants. She noted the low frequency of sampling proposed (one sample per 200m³) was insufficient to adequately reduce the risk of contamination, given it would be periodically inundated by groundwater and the proposed range of material considered to be suitable for back filling. In relation to bird strike risk, she noted that the proposal could cause increased risk of ponding in the McLeans Island area (given daily fluctuations and the proposed small freeboard) and that the mitigation strategies proposed are not sufficient to prevent increased ponding.
120. **Ms Drucilla Kingi-Patterson** spoke to her submission in opposition to the applications. She highlighted the population growth and development around the Bishopdale area and the importance of maintaining the existing drinking water quality. She explained that sometimes, regardless of the scientific information, you have a ‘gut feeling’ about something and that this is the case here. She considered there were not enough safeguards in place and that the changes to the land structure from the earthquakes added to the uncertainty. She urged us to take a long term view and noted she would not be opposed if the proposal was not upgradient of the city’s drinking water supplies. She

asked us to consider any adverse effects of the proposal on water supplies for the animals at Orana Park and Willowbank.

121. **Dr Sally Gaw**, Director of Environmental Science and a Senior Lecturer in Environmental Chemistry with the University of Canterbury, provided a written statement of evidence in opposition to the applications. Her evidence addressed groundwater contamination as a result of quarrying activities, groundwater contamination from leaching of contaminants from back fill, and groundwater contamination with heavy metals, including arsenic as a result of altering groundwater chemistry. She highlighted that options for remediating contaminated groundwater are very limited and costly. She considered that the risks of contaminating groundwater by placing cleanfill directly in the saturated zone were unacceptably high and agreed with Dr Scott's conclusions. She noted that material from HAIL sites could include contaminants for which there are no drinking water limits. She explained that arsenic concentrations in groundwater was an existing issue for the Canterbury Plains and that any changes in groundwater chemistry (such as dissolved oxygen, dissolved organic carbon and acidity levels) could induce reducing conditions and elevate arsenic levels. She noted groundwater monitoring did not include arsenic and that there were no trigger levels for parameters such as dissolved oxygen or dissolved organic carbon that would enable an assessment as to whether reducing conditions were being induced. Overall, she concluded that the applications did not adequately consider the risk to groundwater.
122. **Mr Tony Ineson** spoke to his submission in opposition to the applications. He emphasised that the risk to the drinking water was not acceptable for 'a few cubic metres of gravel'. He noted the original excavation depths had been set to protect groundwater quality and must remain. He considered there was nothing wrong with economic gain, but not at a cost to our drinking water. He noted an article in 'The Press' quoted ECan Commissioner David Caygill stating that regional water quality would improve. He questioned how this proposal would help achieve this goal. He urged that common sense must prevail and considered that such applications should not be able to be made, which waste everyone's time and money.
123. **Dr Alistair Humphrey**, a public health physician employed by the **Canterbury District Health Board (CDHB)**, presented a statement of evidence in opposition to the applications on behalf of CDHB. His evidence outlined the goals of the CDHB, areas of work, and its obligations under the Health and Disabilities Act 2000. He noted support for the objectives of the LWRP to ensure the region's freshwater resources remain a sustainable source of high quality drinking water and that these are protected from degradation. He highlighted that a number of private bores downstream of the quarry site were likely to be adversely affected by the proposal. He considered that the consequences of contamination of the city's drinking supplies were so extreme that it was unlikely that any conditions would be sufficient to address the risk. He highlighted the evidence of Dr Scott that even if the back filling was managed properly, there was still some risk posed to drinking water quality, which could result in DWSNZ guideline values for aesthetic determinands being exceeded.
124. Dr Humphrey considered the groundwater monitoring proposed was inadequate and that a monitoring regime would do nothing to prevent risks to groundwater. He highlighted

the lack of background data for the Selwyn quarry and missing groundwater quality data for the Harewood Gravels quarry and Road Metals at Miners Road. He outlined a number of conditions required if the consents were granted and requested a reduced 20 year consent duration. In response to question, he urged us to not simply focus on the health component of drinking water, to listen to the community, and to understand the unexpected consequences of the risks involved, even if they are small. He noted that the risk was not low, if the consequences are severe, and that in this situation the social and economic costs to the community would be extremely severe. He considered that even with all the best procedures, people make mistakes and that the implications would be irreversible and long term.

125. **Mrs Annell McDonagh** presented written evidence and photographs in opposition to the applications on behalf of her family, who live at 175 Old West Coast Road. She noted that this was the third resource consent application they had opposed in 18 months because of concerns regarding adverse effects on their property and family. She outlined that a recently granted consent for Winstones to expand into rural land at 199 Old West Coast Road would bring the quarry activity to within approximately 190m of their house (reduced from approximately 400m). She noted Yaldhurst residents had lots of experience with monitoring and compliance, and that they had no confidence in ECan to enforce the conditions of consent. She stated that enforcement was almost non-existent and that ECan relied on self-monitoring procedures such as visual checks and form filling, with no actual testing. She considered that problems with dust and the lack of action by ECan, clearly demonstrated that residents would be left to deal with any future water quality issues and the difficulties in proving cause-effect links. She also noted quarries were currently operating outside of consented hours and that ECan would not respond out of hours, leaving it to residents to deal with night time breaches.
126. Ms McDonagh described their shallow (36m) well (M35/10925) and recent problems with their drinking water associated with a white film caused by calcium (photographs were included showing this film on drinking glasses). She noted they had been forced to purchase bottled water and buy a new dishwasher, but that this had not fixed the problem. After investigations by ECan and discovery of high calcium concentrations, they were forced to invest in an expensive system to stop this and due to their ongoing concerns, they were also purchasing an UV treatment system. She emphasised that this and other groundwater monitoring results (including high concentrations of bacterial contamination on the Winstone site) indicated there were already changes in groundwater quality between upstream and down. If the consents were granted, she noted they would have no confidence in their drinking water supply and would be forced to buy bottled water. She highlighted the high cost of testing the water and that monthly testing was still relatively infrequent given the health risks to their children. She considered that the only suitable back fill, given the importance of the groundwater resource, was aggregate from the quarry sites and that all other alternatives should be exhausted before the groundwater is put at any further risk of contamination.
127. Ms McDonagh outlined the background to the 1m buffer from groundwater, noting that the 1974 Paparua Planning Scheme limited excavation depths to no greater than natural groundwater and that subsequent rules had increased this to 1m above HRGL. She referred to the abatement notices served on Winstone for not controlling their dust and

for digging too deep. She was concerned that this enforcement action could be put on hold pending the outcome of this consent process and considered this was wrong. Appended to her statement were copies of an ECan plan showing where groundwater had been exposed on the Winstone site, a letter from the Hon. Amy Adams to the Hon. Nick Smith regarding the consent process, a ECan report regarding community concerns for air quality around Yaldhurst, an article from 'The Press' dated 12 April 2016, an Email from ECan dated 10 June 2016, and a letter from the Hon. Amy Adams supporting the requirement for a 250m buffer from residential properties.

128. **Mr Colin Pearson** spoke to his submission in opposition to the applications. He said he spoke as a concerned resident of Christchurch who valued and appreciated the high quality of our water resources. He urged us to not compromise this when there are significant gravel resources across the region. He did not believe increased transportation costs would put costs out of bounds. He noted the proposal required strict compliance with consent conditions and vigilant monitoring, which clearly is not happening now. He said that if there were adverse effects, they would not be picked up until it was too late to do anything and the ultimately the community would bear the costs.
129. **Te Ngāti Tūāhuriri Rūnanga and Te Taumutu Rūnanga** (collectively referred to as **Ngāi Tahu**) were represented at the hearing by kaumātua **Ms Hoana (Joan) Burgman** and **Ms Lynda Murchison**, a Planner. Ms Burgman presented a written statement addressing the relationship of Ngāi Tahu as mana whenua to the land and water of the takiwā, the cultural significance of water, her duty as kaitiaki, and concerns with how these applications may affect these values. She emphasised the fundamental link between the people of the land and the natural elements, which they descend from and whakapapa to. She noted concern that excavating to depth not previously disturbed, could destroy evidence of historic occupation and significant sites not documented or known. She outlined the significance of water to Te Ao Māori as a life force and a tāonga, and as a link between the physical and spiritual world. She noted that through her lifetime the mauri (life force) of every water body within her takiwā had been degraded by pollution or lack of flow, or both. She expressed her grief that this degradation had occurred on her watch and her sense of failing in her duty as kaitiaki. She emphasised the importance of groundwater in the area of the proposal as the headwaters of springs which feed our lowland streams, such as the Ōtukaikino Stream and Avon River. She explained that the mauri of water is degraded by changes in appearance, taste and smell, regardless of whether it is 'safe' to drink in terms of pathogens. She emphasised the significance of the Ōtukaikino Stream and the proximity of the McLeans Island sites to its sacred springs and tributaries.
130. Ms Burgman considered the Applicants' experts could not provide an assessment of the impact of the proposal on the mauri of the resource, on the values of Ngāi Tahu whānui, nor on their ability to exercise kaitiakitanga. She wanted a Cultural Impact Assessment (**CIA**) to be undertaken to determine the likelihood of earthworks uncovering remnants of Ngāi Tahu occupation. Overall, she considered that even if the risks to Ngai Tahu values were found to be low, the effects would be significant and irreversible.
131. Ms Murchison responded to questions. She noted the provisions of the Mahaanui Iwi Management Plan (**MIMP**) should be considered under section 104(1)(c) and that it was

the Rūnanga who assessed compliance with it or not. After the hearing, she provided further information requesting a separation of 300m from the tributaries of the Ōtukaikino Stream, based on the PDP reports.

132. **Mr Wayne Tewnion** presented a written statement on behalf of this family in opposition to the applications. His family live at 202 Old West Coast Road, and have established a Truffière (22 years ago) and a high end cattery (14 years ago). He expressed concern that predicted water level rise from the CPW scheme would inundate existing back fill in the Miners Road area, potentially contaminating groundwater and flooding existing pits. He expressed his frustration and disappointment with a recently granted consent to Winstone for an extension into Rural 2 land (RMA 92026416), which would bring quarrying to within 100m of their home and business. He outlined significant dust issues they had experienced, an abatement notice served on Winstone for dust, and provided photographs showing thick dust deposition on their car, house and a nearby pine hedge. He expressed shock that this could be called 'less than minor' by experts and noted it was having a significant effect on their health and future crops. He referred to MfE and Victoria EPA guidelines which recommended buffer distance of 200-500m and noted this depended on industries with good environmental controls.
133. Mr Tewnion outlined problems with significant dust emissions when the Winstone quarry extension block was cleared and topsoil stripped in September 2015, and with subsequent windblown contamination of thousands of oak tree seedlings which had been inoculated with truffle spores. He noted that they would now never be able to inoculate the seedlings and that they had been disposed of at significant economic loss. He said that expert advice sought suggested that the contamination from the soil on the extension site where pine trees had grown, could be the beginning of the end for the Truffière. He considered this adverse effect of dust contamination on their truffles and neighbours' plant crops could not be considered to be 'less than minor'. He expressed his frustration at the lack of compliance and enforcement action by ECan and the burden this placed on the community. He outlined numerous incidences of non-compliance on the Winstone site and that issues, such as excavating too deep, have been discovered by residents. He provided photographs of the water race upstream and downstream of the culvert for the Winstone site access, which showed the adverse effects of mud tracked from the truck wheel wash. He was concerned that enforcement action could be 'put on hold' pending the outcome of this process. Overall, he considered there was a significant amount of evidence that demonstrated the quarry operators' attitudes and their lack of commitment to compliance with consent conditions, and the inability of the consent authorities to monitor or enforce these. Appended to his evidence was a letter from the Hon. Amy Adams dated 25 May 2016, photographs of dust emissions, a list of the conditions of consent not complied with by Winstone, and photographs referred to above.
134. The **Department of Corrections** was represented at the hearing by **Mr Wayne McKnight** (Corrections Officer) and **Mr Andrew Willis** (Consultant Planner). Mr McKnight described the three prisons in Canterbury, the occupancy, critical water usage and the consequences of contamination. Mr Willis presented a written statement of evidence giving an overview of the Department's submission, the planning framework, the assessment of effects and risk, and the proposed conditions of consent. He emphasised the critical importance of the secure water supply and the need to consider this as strategic infrastructure under the

relevant statutory plans. He acknowledged the Applicants' assessments indicated the Department's wells were unlikely to be significantly affected, but sought that these be included in the monitoring proposed. He noted that the mitigation and monitoring proposed could not remove the risk. He considered the effects should be considered to be of low probability, but high potential impact.

135. **The Yaldhurst Rural Residents Association (YRRA)** was represented at the hearing by **Ms Sara Harnett Kikstra**, a Committee member. Ms Harnett Kikstra presented a comprehensive statement of evidence in opposition to the applications and called Dr Fenwick as an expert witness. Her evidence outlined local issues regarding the proposed consents, the contamination risk to private wells in the vicinity of the quarries, extension of the life of the existing quarries, lack of enforcement by ECan and CCC, alternative aggregate supplies that don't pose risks to groundwater, uncertainty of future groundwater levels, bird strike risks, visual effects on visitors, the community cost of remediation of pollution, and the environmental effects of the existing quarrying activities on the surrounding community. Appended to her evidence were photographs of flooding in existing pits, newspaper articles, a CCC issues information sheet, guidelines for quarries, a letter from the Hon. Amy Adams, and ECan's annual compliance monitoring report for 2014/15.
136. In summary, Ms Harnett Kikstra stated the YRRA believed that:
- (a) The applications were inconsistent with the purpose of the RMA and were contrary to the policies and objectives of the Christchurch City Plan and the proposed District Plan;
 - (b) The applications would significantly affect the values of the area and were not an appropriate use of rural land;
 - (c) The motivation of the Applicants was about the economic bottom line, and not the environment or future generations;
 - (d) Protection of our water resources is more important than aggregate supply;
 - (e) Alternative aggregate supplies are available and affordable;
 - (f) The potential effects on aquatic invertebrates and the ecology of aquatic sediments has not been considered by the Applicants;
 - (g) The proposal will extend the life of the existing quarries by more than 30 years and would significantly the rural character and future amenity for more than 50 years;
 - (h) The Reporting Officers had erred in their approach to the applications by failing to consider rural character and amenity effects associated with the prolongation of quarrying activities;
 - (i) The sum of adverse effects (or cumulative effect) of successive consents has resulted in major effects on rural character and amenity, when considered against the initial baseline;
 - (j) The Road Metals Environment Court decision 2006 undermined the integrity of the City Plan and set a precedent to extend quarrying onto rural land;
 - (k) These applications would set a precedent for other quarries that are not part of CAPG and this would be more than a minor effect;
 - (l) the assessments undertaken provide no certainty that back fill material would not be saturated for prolonged periods;

- (m) Dr Scott's assessment that the effects of contaminants beyond 1km was unlikely is disputed, given potentially unknown contaminants in the back fill would be saturated at some time in the future for unknown periods of time;
- (n) Current mitigation methods are inadequate to address noise, dust, visual and traffic effects;
- (o) Despite Aggregate and Quarry Association's Environmental Policy, there has been no contact by the Applicants with the community or affected neighbours;
- (p) YRRA and individual residents have raised numerous concerns regarding adverse effects over the last 20 years with the consent authorities and these have not been addressed;
- (q) Consent conditions are worthless without a commitment from the quarry operators and the consent authorities to both compliance and enforcement;
- (r) Evidence given to the Independent Hearings Panel (IHP) for the replacement District plan regarding the risks posed to groundwater from current quarrying (1m above groundwater) and poor compliance with consent conditions, should ring alarm bells for any future consent;
- (s) The costs put forward by the Applicants regarding transportation distances are exaggerated and other viable alternatives have been ignored; and
- (t) There has been very little rehabilitation of exhausted quarry sites and the lack of suitable back fill material will be exacerbated by this proposal.

137. **Dr Graham Fenwick**, a Biologist with NIWA, presented a written statement of evidence supporting the YRRA submission that any back fill would not sustain the biodiversity of invertebrates that are key to the sustainability of Christchurch's groundwater resources. He outlined the key aspects of groundwater biodiversity and ecosystems, the dearth of information on these, and the uncertainty regarding potential adverse effects of the proposal. He described the complexities of the groundwater system, the physical habitat of preferential flow paths, and the importance of the complex balance of dissolved oxygen and dissolved organic carbon in ecosystem function. He outlined the significant biodiversity of stygofauna in the alluvial aquifers and the potential for discovering short range endemic species. He urged us to take a precautionary approach to ensure locally-restricted biodiversity is protected from potential extinction. He explained the inter-dependent and dynamically balanced relationship between biofilms (extracellular polymeric substances) and stygofauna, and their critical role in removing organic contaminants, maintaining aerobic conditions, and sustaining water quality and hydraulic conductivity. He noted that the 2 percent maximum of organic content for back fill is some 10,000 times greater than in aquifer sediments and would very likely stimulate dramatic biofilm growth, leading to a cascade of biogeochemical effects. He considered the proposed control of organic material in the back fill was inadequate and that chemical testing was necessary. He also considered the proposed groundwater monitoring was inadequate and that stygofauna monitoring was imperative given this was a better indicator of water quality. Overall, he concluded there were substantial uncertainties over actual individual and combined potential adverse effects in the medium to long term.

138. **Mr Denis Thomson** spoke to his submission in opposition to the applications and supported the YRRA's submission. He outlined the history of quarrying in the Miners Road area, ongoing adverse effects, the establishment of the YRRA in response to these issues, background to the establishment of the Quarry Zone, lack of consultation with the

community, CCC's bias against rural communities, variability in the sub-soil conditions, groundwater velocities, groundwater monitoring, non-compliance with consent conditions, ongoing dust problems, and the need for adequate separation between quarrying and residential areas. He emphasised that the monitoring results clearly indicated adverse effects were occurring now, without excavating into groundwater. He was highly critical of the lack of enforcement action by CCC and ECan, and previous decisions of both the Council and independent commissioners. He expressed his extreme frustration and exhaustion from battling these significant issues for over 30 years.

139. **Mr Gavin Barclay** provided a written statement in opposition to the applications and expressed his concern that he, at the age of 76 years old, had to defend the gamble and risk that the applications posed to the community. He outlined his significant community involvement over the years and stressed the measures that had been taken to protect our groundwater resource. He criticised the use of commissioners, who he considered were unaccountable to communities, for contentious and unpopular decisions. He emphasised the ineffectiveness of ECan in enforcing consent conditions and considered self-monitoring was unacceptable. He expressed shock at the ongoing storage of contaminated waste on the Blakeley site and gave other examples of ECan's poor enforcement record. He was particularly concerned about the control of back fill material, reliance on unqualified staff for assessing contamination and the huge discrepancies in the evidence between operators regarding rejection of material. He noted ongoing concerns of the community had been ignored by the consent authorities, dysfunctional enforcement systems, and lack of urgency and commitment by Council staff. In determining the applications, he urged us to look at three factors: trust – demonstrated by past performance; integrity - demonstrated by putting corporate greed before the community; and risk – demonstrated by significant uncertainties and no long term remedies.
140. **Mr Charles Bennett** provided a written statement in opposition to the applications. He outlined his experience with three recent resource consent applications (Harewood Gravel, SOL and Frews) and his disillusionment with the process. He emphasised the risks to groundwater quality for Christchurch and surrounding rural wells, and incremental degradation to the point where it will need to be treated. He highlighted ECan information that the groundwater resource is a living system and the importance of the ecology to its sustainability. He was at a loss to understand how anyone could conceive risking such a valuable resource for profits. His key concerns were regarding precedent effects, the quality of the back fill and the fact it would be put directly into groundwater. He considered there were significant risks posed by the 1m buffer and that this should be increased to 4m.
141. **Mr Robert Wynn-Williams** spoke to his submission in opposition to the applications and provided photographs taken at Selwyn Quarries showing 'cleanfill' material including concrete containing reinforcing mesh, plastic, bricks, construction rubble, vegetation, and untreated asphalt. He noted the photographs demonstrated ongoing non-compliance, the behaviour of current operators, the lack of checks in place, and the lack of monitoring. He was concerned by the self-monitoring regime and ECan's approach of 'inspections by appointment'. He considered there were alternative aggregate supplies which did not pose such significant risks to groundwater. He highlighted the near certainty that the pits

would be flooded in the future (quoting Judge Jackson in the Winstone's decision) and that the huge uncertainties in the knowledge represented significant risks. He urged us to take a precautionary approach given the history of the operators, proposed quality of the back fill, our lack of understanding of the groundwater system, and the unknown effects of climate change and the CPW scheme.

142. **Ms Anna Youngman** provided a written statement in opposition to the applications on behalf of herself and her husband, who reside at 190 Old West Coast Road. She expressed concerns about their water supply from their shallow well (30m) and the proximity of the well to the quarries and the area where concrete slurry is disposed of. She noted that they had invested in an expensive water filter system after the earthquakes. She had no faith in the joint consent process, given her recent experience and the bias towards one party. She considered this decision to be the most controversial and important decision a consent authority could rule on for the City's future and wellbeing. She emphasised the inability of CCC and ECan to enforce consent conditions and inadequate complaint response. She was shocked by reliance on visual inspections of truck loads of material and self-monitoring. She considered there were alternative aggregate supplies further away from city and the groundwater protection zone. She noted the quarries were already causing harm and disruption to resident's lives and this would increase to include the residents of Christchurch.
143. **Mr Warren Thomas** provided a written statement of evidence in opposition to the applications, which was tabled at the hearing. He was concerned that the deeper the quarries went the more difficult rehabilitation would be. He was concerned about water quality in downstream bores and preferred to see the McLeans Island quarries deepened because it was further away from bores known to him. He noted the need for water storage and suggested the McLeans Island quarries should be considered for this when exhausted, citing the Lake Hood example.
144. **Transpower New Zealand Limited** provided a written statement by Ms Jenna McFarlane, an Environmental Planner with Transpower, which was tabled at the hearing. The statement outlined a number of conditions to be imposed to address any potential adverse effects in relation to Transpower's assets and security of the National Grid.

Reporting Officer Section 42A Reports

CCC section 42A Report

145. **Ms Emma Chapman**, a Planner with the CCC, provided an Addendum to her s42A Report and called two expert witnesses, Dr Rutter and Mr Watt. She also tabled a memorandum from Ms Adele Radburn, Senior Planner with CCC, addressing rehabilitation and staff recommendations to the proposed District Plan. Ms Chapman confirmed that the conclusions reached in her report were unchanged, on the basis of the evidence presented, and she remained firmly of the view that the consents sought should be refused on the basis of adverse effects on groundwater quality and that overall the activities were contrary to the provisions of the City Plan. She emphasised the large areas of uncertainty with the proposal and lack of understanding of potential adverse effects.

She suggested that to partially address this uncertainty the QFMS should be lifted by 1m at McLeans Island and 3m at Miners Road (1m to reflect actual HRGL, 1m for a buffer and 1m for the predicted effects of CPW). She considered this would avoid periodic inundation of lower quality 'shallow' fill.

146. Ms Chapman re-iterated her concerns that the proposed conditions were insufficient to adequately mitigate adverse effects, that there is doubt that these conditions can be complied with in a practical sense, and that a rehabilitation plan must be required if the consents were granted. She considered the Christchurch-West Melton aquifer should not be considered to be an 'outstanding natural feature and landscape' under s6(b), as this references landscape matters only. She cautioned that Dr Temple's evidence was based only on the PDP assessments and that he did not have the benefit of reviewing the evidence of Dr Scott, Dr Rutter, Mr Watt, Dr Burbery, Dr Dudley Ward or Dr Gaw. She emphasised that despite recommendation to the Applicants, they had chosen not to incorporate these. Overall, she concluded that because the applications failed both threshold tests in section 104D, we did not have discretion to grant the consents. In response to questions, she agreed that the extended duration of adverse effects associated with the current quarrying activity was a legitimate concern, particularly given that one site was close to exhausting onsite aggregate resources.
147. **Dr Helen Rutter**, a Senior Groundwater Hydrologist with Aqualinc Research Limited, was engaged by CCC to provide evidence in relation to the impacts of the proposal on the aquifer system that supplies Christchurch and its wider environs. Her report outlined the Christchurch groundwater system, hydrogeology of the sites, existing rules and conditions, determination of HRGL and the proposed QFMS, existing effects and potential effects, monitoring groundwater quality, compliance and community involvement, and issues raised in submissions. In summary, she concluded that:
- (a) Excavation and placement of fill in the zone of water table fluctuation would increase the risk of potential contaminants leaching and provide for a more rapid route for contaminants to enter groundwater if there was a spill;
 - (b) There are existing impacts on groundwater quality from 'cleanfill' activities, affecting aesthetic determinands and this would be added to by the proposal;
 - (c) Proposed trigger levels and existing measured concentrations of determinants may be toxic to surface water biota and groundwater invertebrates;
 - (d) Better groundwater quality at McLeans Island is likely to be a reflection of less placement of 'cleanfill' historically and possibly less sampling, rather than from more dilution;
 - (e) The proposed QFMS has been breached historically at Miners Road and McLeans Island and would be exceeded periodically at both sites, and given the uncertainty a precautionary approach should be taken;
 - (f) Proposed conditions and monitoring are inadequate to protect groundwater users and to intercept potential groundwater effects; and
 - (g) It is not clear who would take immediate responsibility if there is an issue and proposed monitoring will not enable identification of the likely source of contamination.
148. Dr Rutter provided an Addendum to her report at the hearing and confirmed that the conclusions reached remained unchanged on the basis of the evidence presented. She

emphasised that maintaining 1m separation between the base of the excavation and groundwater provided additional time to clean up spills, additional capacity of the soils and unsaturated zone to attenuate some contaminants, and reduces the risk that any fill would be inundated. She noted determining the HRGL with any confidence was difficult and may not be accurate to within several metres, therefore a degree of conservatism was warranted. In addition, the CPW scheme was predicted to increase groundwater levels by more than 1m in the Miners Road area. She noted that the vertical hydraulic gradient was still in dispute, and that the groundwater was vulnerable due to the downward hydraulic gradient and lack of confining layers in the areas where the quarries are located.

149. Dr Rutter considered that the elevated nitrate levels in some shallow wells demonstrated that anthropogenic effects can impact Christchurch's water supply and this has contributed to the replacement of shallow wells. She outlined a number of examples where past uncontrolled landfilling had left legacy issues from contamination; and noted that leachate generation was a highly complex process and identification of effects was dependent on intercepting preferential flow paths and timing of sampling. She stated the historic Paparua and Waimairi landfill were likely to have a confining layer, making the sites relatively secure containment sites. She considered these examples were not comparable to the proposal where there would be deliberate placement of material in the zone of water table fluctuation over a large area. She agreed with Dr Burberry that the Applicants had provided no evidence as to the long term leaching that was likely to take place in an alternately saturated and unsaturated state. She noted that some of the photographs produced by submitters appeared to show that groundwater had been exposed in some existing pits at Miners Road.
150. Dr Rutter discussed the difficulty in monitoring contaminants in complex systems and considered the assumption used by Mr Callander of 100,000 times dilution was wrong. She noted that groundwater monitoring can miss 'peaks' due to bore siting, monitoring frequency, or monitoring at the wrong time. She considered there was a real risk that an individual monitoring well would not intercept contamination due to the nature of groundwater flow. She emphasised concern with the proposed operational freeboard of 0.3m at McLeans Island and questioned how operationally this would be maintained given water level fluctuations. She agreed with Dr Burberry that the PDP modelling had huge uncertainty due to its simplicity, assumptions and lack of sensitivity testing. She also agreed with Dr Dudley Ward that it was not appropriate to place such confidence on things that aren't accurate and considered 'we just don't know what the effects would be'.
151. **Mr Fraser Watt**, an Environmental Consultant, was engaged by Aqualinc Research Limited to provide a review of the potential contaminants associated with the applications and associated risks to groundwater on behalf of CCC. His report was appended to the CCC s42A Report. The report outlined the current and proposed quarry operations' contaminants of concern, excavation and operation hazard and risks, groundwater fluctuations, changes and possible mitigations in fill material hazard and risk, and groundwater quality monitoring. He concluded that the proposal would increase the risk to groundwater resources by bringing quarrying activities closer to standing groundwater, placing unsuitable back fill material within or close to groundwater, and exposing groundwater to other contaminant sources. He considered the greatest risk to

groundwater resources was posed by the nature and quality of imported fill for 'deep' (wet) placement and 'shallow' fill if it became inundated or saturated.

152. Mr Watt stated that if effective quarry operating procedures could be agreed and appropriate controls on imported material could be drafted and implemented, then the effects on the groundwater resources were likely to be less than minor. However, he considered the applications had not adequately addressed these matters to ensure this was likely to be the case. He also considered that the proposed monitoring regime and the proposed actions in the event issues were identified failed to provide assurance that issues would be identified in a reasonable time and that it would be addressed in a sufficient manner to protect human health and the environment.
153. Mr Watt provided an Addendum to his initial report at the hearing and confirmed that his key conclusions had not altered on the basis of the evidence presented. He emphasised that his concerns primarily related to the nature of the back fill material and potential adverse effects on local abstraction bores in the upper aquifer. He considered the Applicants had not demonstrated that the procurement, checking and placement process for the back fill would be sufficiently controlled to ensure the environmental effects were less than minor.
154. On the basis of the evidence, Mr Watt considered the upper level of 2 percent of vegetative or organic matter in the back fill was too great and that the back fill sampling frequency proposed (one sample per 1000m³) was insufficient. He noted that concerns regarding the definition of 'shallow' fill could be addressed by placing the material at a level which was unlikely to be inundated by groundwater. He considered that a site specific WAC (i.e. absolute contaminant limits) was required given the nature of the back fill (across Classes 2, 3 and 4 of the WasteMINZ 2016 guidelines) and the absence of any form of engineered containment.
155. Mr Watt stressed that the proposed QFMS must be set at a level that ensures periodic inundation of 'shallow' fill is avoided and that given the uncertainty, which was acknowledged by Mr Callander, a 1m buffer should be added to this level. He noted the impact of the current operations on groundwater quality (e.g. increases in hardness, alkalinity and salinity) related to 'flushing' and that this was evident in 'spikes' in groundwater parameters following rainfall and high water table levels. He considered the 'first flush' scenario posed the most significant risk to local abstraction wells, resulting in the release of significant plugs of readily soluble contamination. He noted this discernible and measurable effect on groundwater quality was occurring with fill placed above the groundwater table. He emphasised that the effect of placing fill at a level where the groundwater table is likely to rise to and passes through *en-masse*, at variable flow rates, and for unknown durations (days or weeks?) had not been fully examined. While he noted this effect would be transient, he considered this could result in significant downgradient increases in groundwater parameters, with likely aesthetic taints to nearby wells.

156. **Ms Hannah Goslin** and **Mr Joe Harrison**, Consent Planners with ECan, provided an Addendum to their s42A Report (dated 19 June 2016) and called Dr Lisa Scott as an expert witness. The Addendum addressed - the Three Kings Decision and the key differences in the activities; the need for discharge permits and a section 105 analysis; a comparison of the proposed QFMS, HRGT and SHWT; the bundling of activity status across district and regional plans; risk and scientific uncertainty; the significance of the Christchurch-West Melton groundwater resource; recommendations; and conditions. Overall, the Reporting Officers remained of the view that the proposed activities would result in more than minor adverse effects on groundwater quality for neighbouring groundwater bore owners and that the mitigation proposed was insufficient to adequately address the effects of the activities. On the basis of their conclusions, they recommended that the applications be declined. Attached to their Addendum was a memorandum from Mr Phillip Maw and Ms Kate Woods of Wynn Williams Lawyers addressing the interpretation of the LWRP definition of SHWT and how it applied to the applications, and bundling activity status' across district and regional plans.
157. **Dr Lisa Scott**, a Senior Groundwater Quality Scientist with ECan, provided an Addendum (dated 16 June 2016) to her original report addressing the resilience of the Christchurch aquifer system, existing effects on groundwater quality at Miners Road, the proposed QFMS at Miners Road, arsenic levels in groundwater, the benefits (or not) of a clay liner, and groundwater monitoring. Attached to her Addendum were copies of an 'Isopach contour map for the lower Waimakariri River Plain' (Weeber 2008), a map showing the vertical hydraulic gradients in wells (Weeber 2008), results from water quality monitoring at a well near the historic Waimairi Landfill, results from water quality monitoring at a well near the historic Paparua Landfill, a location map of the wells sampled, a graph of water levels and hardness concentrations in wells downgradient of the Winstone site at Miners Road, a graph of water levels at Miners Road in comparison to the proposed QFMS and SHWT, aerial photographs of water inundation at Miner Road two months after heavy rain in 2013 and three months after heavy rain in 2014, a graph showing the correlation between rainfall at Christchurch Airport and hardness concentrations in wells downgradient of the Winstones site at Miners Road, and graphs demonstrating the relationship between electrical conductivity and hardness in Winstones monitoring data compared to the relationship with dissolved aluminium.
158. In summary, Dr Scott made the following key points:
- (a) The activities referred to by Mr Chapman, by SCIRT after the earthquake, are not comparable to the proposed activities given their short term nature and location;
 - (b) The quarry sites are located within the aquifer recharge zone, where groundwater is vulnerable to contamination due to the downward hydraulic gradient and lack of confining layers;
 - (c) The examples of the Waimairi and Paparua Landfills do not demonstrate the resilience of the aquifer system, but rather illustrate how the groundwater resource can be contaminated by careless actions and lack of understanding;
 - (d) Groundwater monitoring of these past poor practices indicates this contamination is not attenuating over time (and in some situations it is getting worse) and that some local groundwater supplies have become unpotable and unpalatable;

- (e) Assessments made rely heavily on limited groundwater quality monitoring data and the recent investigation over 2015/16, which was undertaken during a prolonged dry period and represents a 'best case scenario';
 - (f) There is a close correspondence of peaks in dissolved contaminants in downgradient wells with high water table;
 - (g) On a purely technical basis, the proposed QFMS should be increased by 1m to reduce the risk of inundation of 'shallow' fill and provide for better protection of local groundwater quality;
 - (h) Dr Gaw's evidence illustrates the uncertainties associated with changing groundwater chemistry; and
 - (i) Use of a clay liner is not supported.
159. In response to questions, Dr Scott outlined the difficulties in distinguishing between the effects of each quarry and the need to install monitoring wells on each site's boundary upgradient and downgradient. She noted that elevated potassium levels downgradient of the landfills indicated landfill leachate and not other land uses, such as historic wood treatment sites. She noted that concerns regarding groundwater quality regionally primarily, related to nitrates and declining water quality in lowland streams. She considered that the existing groundwater quality data was a 'red flag' that there were existing effects and that these were somewhat expected given the activities occurring. She outlined difficulties with establishing cause-effect links in the event that groundwater quality was affected and considered the McDonagh's submission illustrated this. Overall, she considered it was not a good idea to fill directly into groundwater or the saturation zone, particularly given the 'first flush' effect.
160. **Mr Marty Mortiaux**, Regional Manager – RMA Monitoring and Compliance with ECan, attended the hearing at our request and answered questions. He outlined monitoring undertaken in the Yaldhurst area, past non-compliances with excavating into groundwater, recent dust monitoring undertaken, work going on with the industry to ensure compliance with consents, lack of resources for proactive monitoring, the need to prioritise complaint response, the need for robust monitoring, and the communities distrust of self-monitoring. He noted ECan considered self-monitoring was appropriate given the quarry operators are reputable people from reputable companies, they had confidence in the monitoring data, lack of ECan resources, and six monthly visual compliance inspections (as required for a 'high risk activity'). He acknowledged the community complaints had some basis and that there was a 'combination of effects' occurring from time to time. He noted Selwyn Quarries had had dust issues in the past, but were working with the SDC to resolve these. He said he had not visited the Miners Road area because he relied on Council Officers to undertake investigations and carry out their jobs, and was confident of the information provided by them.

Further Information

161. At the adjournment of the hearing, we indicated a number of matters requiring further information from the submitters, the Reporting Officers and the Applicants. We discussed which of these matters required circulation to the parties as 'new evidence' and agreed how this process would be undertaken. We indicated to the parties present that in the event some or all of the consents were granted, we would issue an interim decision

enabling a further process to review and comment on recommended conditions of consent. We requested that the Applicants proffer a revised set of generic conditions addressing the matters raised during the hearing. We noted that the generation of individual consent documents and conditions for each site would require a significant amount of time and effort, and that this exercise would not be undertaken until we had made our overall determination.

162. Following the adjournment, we received the following further information:
- (a) A memorandum from ECan's Reporting Officers (dated 27 June 2016) providing a legal opinion on the need for discharge permits under section 15, and a section 105 assessment and an assessment of the discharge activity under the provisions of the LWRP;
 - (b) An Email (dated 24 June 2016) from Ms Murchison on behalf of Ngāi Tahu requested a 300m separation distance from the application site boundaries and the tributaries of the Ōtukaikino Stream based on the PDP assessment;
 - (c) A copy of an ECan report regarding community concerns for air quality around the Yaldhurst quarries;
 - (d) A memorandum to CCC's Reporting Officer (dated 27 June 2016) from Brookfields Lawyers that the Christchurch-West Melton aquifer was not an 'outstanding natural feature' under section 6 of the Act and a copy of Appendix 4 of the Canterbury Regional Policy Statement;
 - (e) A memorandum (dated 1 July 2016) from Mr Chapman on behalf of the Applicants providing the following further information - updated plans of the quarry sites showing areas to be deepened and areas rehabilitated; a table showing the current consent requirements for rehabilitation; a map showing the availability of 'other' locations for potential quarry operations; a revised 'deep' and 'shallow' fill categorisation chart based on WasteMINZ 2016 Guidelines; a map of historic landfills around Christchurch; a map of McLeans Island showing the community protection zone around CIAL bores; a revision of Mr Callander's paragraph 21 of his statement of evidence; an updated figure showing the Thornton's bores at McLeans Island; an updated figure agreed to with the ECan Regional Engineer regarding stopbank separation distances; a map of the tributaries of the Ōtukaikino Stream in relation to the application sites; and a response by Mr Callander to the query regarding the Pang study referred to in his evidence;
 - (f) Comments from Mr Robert Cross, Mr Craig and Mrs Annell McDonagh, Mr Quentin and Mrs Annabelle McKenzie, Mr Brandon Hutchison, Ms Vicki Christoffersen, Ms Ana Youngman, Ms Sara Harnett Kikstra on behalf of YRRA, Mr Jim Turpin, Mr Richard English on behalf of the Water Rights Trust, and Mr Peter Armstrong in relation to the Applicants' map showing the availability of 'other' potential quarry sites – 'Appendix C';
 - (g) A memorandum to the ECan Reporting Officers (dated 7 July 2016) from Wynn Williams Lawyers giving the legal opinion that the Hearings Commissioners are able to grant discharge permits in addition to land use consents if it is determined that all the necessary information regarding actual and potential effects has been provided;

- (h) A memorandum from Duncan Cotterill (dated 9 July 2016) addressing the ability to grant discharge permits, which concluded that the Hearings Commissioners have the jurisdiction to grant discharge permits, and that sufficient information has been provided to describe the activity and make a section 105 assessment; and
- (i) A memorandum from ECan's Reporting Officer's (dated 14 July 2016) providing an assessment of the LWRP rules for the discharge permits and comment on the Wynn Williams legal opinion.

Applicant's Right of Reply

163. Mr Chapman indicated at the hearing a number of matters that he would be addressing by way of written ROR. We were provided with the Applicant's closing submissions and a revised set of proposed conditions on 26 July 2016. In summary, Mr Chapman made the following main points:
- (a) More precise conditions relating to back fill management and acceptance are proffered based on the WasteMINZ Guidelines acceptance criteria and the requirement to have 'deep' fill available before actual deepening would be the key conditions which controls the rate of extraction;
 - (b) The surrendering of existing consents will lead to an overall improvement of 'cleanfill' management at all sites and Winstones concrete slurry discharge consent would be surrendered voluntarily;
 - (c) Legal opinions confirmed that discharge permits can be granted in addition to the other consents sought and conditions have been proposed for these replicating the land use consent conditions;
 - (d) Risk assessment should consider that no effects have arisen on drinking water supplies from historical activities, that modelling has assessed both ends of the spectrum of contamination transport, and other comparable contaminant transport from sites with significantly more risk;
 - (e) In consideration of the three elements of risk (clause (d) above) the Applicants' analysis is that both the sensitivity of the receiving environment and risk are acceptable;
 - (f) CAPG is committed to a workable liaison committee to monitor and discuss conditions to the progression of the consents;
 - (g) The significance of aesthetic values incorporated in the DWSNZ and the NES Drinking Water should be approached with care and the evidence of Dr Temple is preferred;
 - (h) The Applicants have reached agreement on conditions with the Department of Corrections;
 - (i) The NES Drinking Water only applies to registered drinking water supplies and is not relevant to an individual's own bore for drinking water;
 - (j) The Harewood Aviation Park bore is a registered drinking water supply providing supply to more than 501 people and the PDP modelling indicates there would be no exceedance of MAVs or GVs given it is some 1,500m distant, therefore Regulation 7 of the NES Drinking Water does not prevent the grant of consent;
 - (k) The proposal will not lead to any significant effects on the CIAL bore, the Prison bore or the Christchurch city supply bores;
 - (l) The DWSNZ GVs for aesthetic determinants are not absolute values and are guidelines which are classified as Priority 3 because they do not pose a direct threat to public health;

- (m) Aesthetic GVs are derived from a consideration of a number of factors and exceeding these for a short period will not render the water unacceptable and 'spikes' in hardness do not mean there has been a deterioration in water quality;
- (n) The evidence with respect to existing effects on groundwater quality indicates compliance with the DWSNZ, with the exception of isolated breaches of the GV for hardness which likely due to the disposal of concrete slurry;
- (o) There are key distinctions between the proposal and the Three Kings Quarry given the separation between the proposed activities and aquifer, the location of community drinking water supplies, and the quality of the back fill;
- (p) Given Winstone and others are able to deposit material below HRGL, this application will see an improvement from the current situation with more stringent controls, better quality fill, better groundwater monitoring, replacement supply if there are adverse effects, better separation, and security rehabilitation will occur at all sites, which are all positive effects relevant under section 104;
- (q) The aquifer should not be considered to be an 'outstanding natural feature';
- (r) There is no evidence that the 'cloudy' appearance of the McDonagh's glasses was caused by hardness or that quarrying was the cause;
- (s) The RMA does not require that adverse effects be avoided only, but also allows for effects to be remedied and mitigated;
- (t) Excavation at the application sites can continue for unlimited durations under the permitted activity rules or in accordance with resource consents issue by CCC and SDC;
- (u) These are not 'fanciful' applications, but rather are made on the basis of the need to plan for future aggregate supplies and limitations on other available options (both river and land based);
- (v) It is accepted that conditions relating to rehabilitation can be imposed and that any risk of inconsistency with the IHP process is a risk to the Applicants; and
- (w) The consents sought should be granted in principle, with a process to determine individual consent conditions in line with the determined principles.

ASSESSMENT

164. In assessing the applications before us, we have considered the application documentation and assessment of environmental effects (AEE), the s42A Reports and technical reviews, all submissions received and the evidence provided during and after the hearing.
165. In making our assessment, we are required to consider the actual and potential effects of the applications on the existing environment, which includes lawful existing activities, permitted activities and any activities authorised by existing resource consents.
166. We have taken the time to provide a relatively detailed summary of all the evidence presented at the hearing above. This approach enables us to focus on the principal issues in contention without addressing every point made. However, we record that we have considered all of the matters raised in making this determination.

Status of the Applications

167. The starting point for our assessment of the applications is to determine the status of the proposed activities.
168. Mr Chapman submitted the applications should not be bundled across the regional and district plans, and that the applications for new consents should not be bundled with the section 127 consent variation applications. He submitted that the test as to whether an activity is contrary to the objectives and policies should be considered only against the objectives and policies of the plan which hold the activity as non-complying.
169. Mr Bligh also considered the applications should not be bundled across the regional and district plans, and that the applications for new consent application should not be bundled with the section 127 variation applications. He noted that regional councils and district councils have different functions under section 30 and 31 of the RMA, and that the ECan land use consent applications should be considered as restricted discretionary activities under the provisions of the LWRP.
170. Mr Pizzey submitted that bundling across regional and district plans was appropriate for these applications given the significant overlap between the plans regarding adverse effects on water quality and management of the activity and fill. He submitted that Mr Chapman had referred to the leading High Court authority (*Newbury Holdings Ltd v Auckland Council [2013] NZHC 1172 (HC)*) and that the case cited by Mr Chapman (*AA Hamilton v Far North District Council [2015] NZEnvC 012*) supported bundling the status of the activities across plans if the overlap is significant, but not bundling objective and policies across plans for the purposes of the threshold test under section 104D.
171. Mr Williams also disagreed with Mr Chapman, noting the High Court authority (referred to by Mr Pizzey above), and submitted that the section 127 applications should also be considered in the context of the relevant objectives and policies as non-complying activities, and should not get a 'free pass' by virtue of section 127(3).

172. There was agreement between the Reporting Officers that the applications for new resource consents should be 'bundled' across the regional and district plans and considered under the more restrictive classification, as non-complying activities. They considered this was appropriate given the significant overlap between the consent authorities in relation to groundwater quality. The legal opinion on this matter from Wynn Williams Lawyers (attached to the ECan Reporting Officer's Addendum) supported this approach.
173. The ECan Reporting Officers considered that given the overlap in potential effects of the discharge activities and the land use activities, these too should be bundled with the other applications and considered as non-complying activities.
174. Having considered the submissions made, we accept that given the significant overlap in the relevant planning provisions in relation to groundwater quality, it is appropriate to bundle the CCC and ECan applications across regional and district plans. We also agree with Mr Williams that the section 127 applications should not get 'a free pass'. We note that 127(3)(a) states only that sections 88 to 121 apply with all necessary modifications, as if the application for a resource consent were a discretionary activity. We consider this is no different to the effect of a rule in a plan, which sets the status of an activity, and the fact that it may be appropriate to bundle the applications. A "deemed" discretionary activity under s127 is no different from any other discretionary activity which may be bundled.
175. We therefore consider the applications for new resource consents, with the exception of the application by Selwyn Quarries, and the applications to change the conditions of existing consents under s127, with the exception of the application by Isaac Construction, should be bundled and considered as **non-complying activities**. The Selwyn Quarries application and the Isaac Construction application (at McLeans Island) are considered as **discretionary activities** under the LWRP, which is the most restrictive status for the discharge permits. As the majority of the Harewood Gravels site at McLeans Island is in the Rural 5 zone and breaches a critical standard in that zone we consider that application to be a non-complying activity.

Statutory Considerations

176. In terms of our responsibilities for giving consideration to the applications, we are required to have regard to the matters listed in sections 104, 104D and 105 of the Act.
177. Pursuant to section 104(1), and subject to Part 2 of the Act, which contains the Act's purpose and principles, we must to have regard to-
- (a) *Any actual and potential effects on the environment of allowing the activity;*
 - (b) *Any relevant provisions of a national environmental standard, other regulations, a national policy statement, a New Zealand coastal policy statement, a regional policy statement or a proposed regional policy statement, a plan or proposed plan; and*
 - (c) *Any other matters the consent authority considers relevant and reasonably necessary to determine the application.*

178. Under section 104(2), when forming an opinion for the purposes of section 104(1)(a) regarding actual and potential effects on the environment, we may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect. This referred to as consideration of the 'permitted baseline'.
179. In terms of section 104(3), in considering the applications, we must not have regard to any effect on any person who has given written approval to the application.
180. Under section 104B, we may grant or refuse the applications, and if granted, we may impose conditions under section 108.
181. For applications for activities considered as non-complying activities, pursuant to section 104D(1), we can only grant consent if either -
- (a) *The adverse effects of the activity on the environment will be minor; or*
 - (b) *The application is for an activity that will not be contrary to the objectives and policies of the relevant plans.*
182. In terms of section 105, when considering section 15 (discharge) matters, we must, in addition to 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 reason for the proposed choice; and*
 - (c) *Any possible alternative methods of discharge, including discharge to any other receiving environment.*

Existing environment

183. The application documentation and s42A Reports included accurate descriptions of the existing environment, which we adopt and will not repeat here.
184. Mr Chapman submitted that the existing quarries formed part of the existing environment and that the associated effects can be disregarded when considering the effects arising from the applications. He noted that there would not be any increase in visual, traffic, noise and dust effects, and that consideration of these effects are not relevant to the determination of these applications. In response to questions, he agreed that the extended duration of these existing environmental effects, that would be enabled by these applications, was a relevant consideration. However, he noted that the duration of the existing activities was either unlimited (under CCC resource consents or existing use rights) or by consent duration for the regional consents.
185. Mr Chapman submitted that existing 'cleanfill' activities have been an integral part of quarry management and that such activities have had no effect on the quality of Christchurch drinking water supplies.
186. Mr Bligh also addressed the existing environment and the permitted baseline in evidence. He noted that the current level of rehabilitation anticipated on the existing quarry sites and the potential impacts of the CPW scheme consents, formed part of the existing

environment. He also considered it was important to understand what was historically allowed, in terms of excavation depths, under previous planning documents when existing activities were established, and that establishing this was not as simple as Ms Chapman suggested. He was of the opinion that some sites at Miners Road were not necessarily restricted to being 1m above HRGL and that this should not be assumed to be the current baseline of all the quarries.

187. Mr Bligh noted that there were no existing rules or consent conditions requiring backfilling to a certain level and that sites can be rehabilitated (top soiled and revegetated) at the final levels of excavation.
188. In relation the predicted effects of the CPW scheme, Mr Bligh stated that if operators chose not to back fill, it was possible that some pits would be inundated by groundwater in the future. He noted that this effect could occur without this proposal and that Ms Chapman was seeking to control this existing effect.
189. Ms Chapman noted in her Addendum that existing use rights only applied to the quarries at Miners that do not hold existing resource consents from CCC (Winstone, Road Metals and KB Contracting). She noted the limitations of section 10, and that these existing use rights had never been proven and would be very difficult to prove in terms of spatial extent, depth and intensity (rate of extraction) over the years. She considered an assertion did not amount to proof and that no evidence had been provided in this regard. She noted that we are not required to rule on the question of existing use rights, but that caution should be exercised in the use of existing use rights as a baseline to compare the effects of the proposal. She considered that the operators are either operating under the provisions of the operative City Plan or existing resource consents and that this is the permitted baseline.
190. Ms Chapman remained firmly of the view that the operators at Miners Road and McLeans Island are limited to 1m above HRGL, with the exception of Christchurch Readymix where the maximum depth of excavation is set at a higher level. Furthermore, she noted that the proposed QFMS had been set at the Seasonal High Water Table (**SHWT**)⁸ and not 1m above the maximum recorded groundwater level which is a permitted activity under Rule 4-3.4.5 of the City Plan, or SHWT for the LWRP. She also referred to provisions of the proposed District Plan that would need to be complied with in relation to traffic generation and rehabilitation. She noted that rehabilitation (which includes filling) could continue for an extended period of time, but that given it is only economically viable while excavation occurs this would be predominantly governed by the availability of aggregate on each site.
191. In relation to whether the Miners Road operators would be allowed to remain on their existing site indefinitely, Ms Chapman noted that legal advice received had indicated that the City Plan only allowed for the processing of imported material under the definition of 'mineral extraction activity' as an 'additive' that is not more than 50 percent of the final product and that other 50 percent must be excavated from the site. She highlighted that

⁸ We were advised by the ECan Reporting Officers that for the purposes of our assessment of the applications SHWT (as defined in the LWRP) is the same as HRGL.

the City Plan framework regarded mineral extraction to be a temporary (albeit long term) activity that would cease when the *in-situ* resource is exhausted.

192. Ms Chapman also noted that the CPW scheme and the predicted effects of the activities authorised under unimplemented consents formed part of the existing environment. She highlighted there were two aspects to this in relation to Miners Road – the potential restriction of allowable excavation depth and potential inundation of fill material. She considered that allowing for a 1.5m rise in the groundwater table would result in up to 0.5m of existing fill potentially being inundated periodically, at unknown frequencies and durations.
193. We note general agreement between the experts that the revised predicted rise in groundwater levels at Miners Road from the implementation of the CPW scheme would be in the range of 0-1.5m. All experts agreed that allowance for a 1m rise was appropriate for the purposes of our consideration. We consider that HRGL in the existing environment is that level, as of the date of this decision, plus 1m for the CPW scheme. We accept this level is the highest level groundwater can be expected to reach on the records to date.
194. Overall, we agree with Ms Chapman that in the absence of any proof of existing use rights prior to the City Plan, operators without resource consents from CCC can only excavate in accordance with the permitted activity rule in the City Plan i.e. 1m above HRGL. We consider any excavation and back filling below this depth or the level set by a resource consent is unauthorised and does not form part of the existing environment. We disagree with Mr Chapman that any discharge of ‘cleanfill’ below 1m above HRGL is permitted either by existing use right or resource consent. Furthermore, a discharge permit would be required under section 15(1)(b), as discussed earlier.
195. We also accept that the importation of more than 50 percent of processed aggregate is not a permitted activity under the City Plan and that the duration of the existing mineral extraction land use activity is limited by the *in-situ* resource on each quarry site.

Actual and potential effects on the environment

196. Our assessment of actual and potential effects on the environment focuses on the key matters in contention. We note that some of these matters such as precedent effects, the availability of the aggregate resource and alternatives, and compliance with and enforcement of existing consent conditions are not strictly 'environmental effects' of the proposed activities. We therefore consider these matters under s104(1)(c) 'other matters' in our assessment below.
197. On the basis of the evidence presented we accept that any actual or potential effects on:
- (a) Groundwater levels and water quantity are likely to be minor more than 100m from deeper excavations;
 - (b) Electricity transmission infrastructure can be avoided and mitigated by the imposition of the consent conditions to ensure any adverse effect is likely to be less than minor;
 - (c) Aviation associated with increased risk of bird strike can be avoided and mitigated by the imposition of consent conditions to ensure any adverse effects are minor; and
 - (d) The Waimakariri River flood protection scheme can be avoided and mitigated by the imposition of conditions requiring setback distances from stopbanks.
198. Our consideration of actual and potential environmental effects focuses on the following matters:
- (a) Groundwater quality effects;
 - (b) Ecological effects;
 - (c) Ngāi Tahu cultural values;
 - (d) The extended duration of quarrying activities at Miners Road; and
 - (e) Positive effects.

Groundwater Quality Effects

199. The most significant differences in opinion between the parties relates to potential adverse effects on groundwater quality. The Applicants' case is that any adverse effects on groundwater quality will be minor or less than minor on the basis of the PDP reports. In contrast, the Reporting Officers and their technical reviewers consider that the proposal is likely to result in adverse water quality effects for groundwater users in the vicinity of the quarry sites. The Reporting Officers and their technical advisors also agreed that any adverse effect on any community drinking water supplies were likely to be less than minor, given the distance between the applications site and the wells and the PDP modelling undertaken. It was however acknowledged that there was still some risk given the proposed QFMS level, the potential inclusion of contaminated material, and potential lack of strict adherence with consent conditions. Submitters generally agreed with the conclusions of the s42A Reports and emphasised that any adverse effects on groundwater quality are unacceptable given the importance of the groundwater resource to the community.
200. In having regard to the evidence, we accept that any potential adverse effects on groundwater quality from the excavation activities can be avoided or mitigated by the imposition of consent conditions. We accept that avoiding the exposure of groundwater and maintaining an adequate separation distance would sufficiently address any concerns

regarding contamination from accidental spills and bacterial contamination from the exposure of groundwater. We consider a 1m buffer between excavation activities and groundwater provides only a minimal level of protection and that this should not be reduced. We are firmly of the view that at least 1m of undisturbed material is critical to provide for some level of treatment of bacterial contamination and to enable time for a response (e.g. removal of material) in the event of an accidental spill of hydrocarbons.

201. We are extremely concerned that the recent aerial images provided in the Addendum evidence of Dr Scott show that nearly all of the Miners Road quarry sites appear to have standing groundwater in the pits, months after rainfall events. This indicates to us that maximum excavation depths have been exceeded and the 1m buffer to groundwater has been widely breached. This exposure of groundwater for extended periods is of concern as it significantly increases the risk of bacterial contamination of shallow groundwater and potentially the risk of bird strike. We were also concerned by the photographs provided by YRRA showing extensive flooding in the existing pits at Miners Road and the operators lack of explanation. We consider this exposure of groundwater to be unacceptable and that it must be avoided and remedied. In this regard, we view the 1m buffer between excavations (and hence back filling) and groundwater to be a critical environmental bottom line that should adhered to 100 percent of the time and strictly enforced by the consent authorities. This is clearly not happening.
202. We agree with the expert witnesses that it is the back filling activities that pose the greatest risk to groundwater contamination and consider there are two critical elements to protecting groundwater quality:
- (i) The depth of placement of back fill (proposed QFMS); and
 - (ii) The nature and quality of the back fill.

Proposed QFMS level

202. The Applicants' proposed QFMS is the level to which the deepened excavations would be back filled with 'deep' fill material and we were told that this was based on the HRGL as at 1973, even though higher levels have been recorded since this time, particularly in more recent years. We understand the Applicants' reasoning for is that some of the quarries at Miners Road were operating before this time and therefore had the ability to excavate to the groundwater table or below it at that time, before controls limiting excavation depths were introduced in district plans and possibly in a bylaw of the former North Canterbury Catchment Board. Mr Bligh advised that such controls appear to have been introduced around about that time or a little later and that historic evidence from 1973 aerial photographs appears to show some quarrying activity at Miners Road.
203. However, we do not understand the Applicants' reasoning about this. It somewhat resembles the notion of lawfully established existing use rights. However, the Applicants were quite clear that they were not asserting an existing use right, because of the difficulties in proving that. We consider that for the Applicants' position to be correct they would have to have been excavating below that 1973 highest groundwater level before it occurred, and that it is not possible to prove this occurred with any certainty at all. We consider it is not enough to assert that quarry activity was present in 1973 in order to claim any operator now has a right to excavate down to or below the 1973

- highest groundwater level. In our view, it would be necessary to demonstrate that quarrying to that depth had actually occurred, i.e. the operators had exercised that right.
204. A further difficulty for the Applicants is that the historic aerial photographs show that not all the sites at Miners Road now proposing to rely on the proposed QFMS were being quarried in 1973. In fact, they show much more limited extent of quarrying than currently exists. If the argument had any validity, then all these sites would have had to have been exercising that opportunity at the time. Otherwise where would the right to rely on this level stop? The area currently described as Miners Road is just a rather artificial construct established by the former Papanui District Council and the CCC when they created the Rural Quarry zone after the HRGL was recorded in 1973. Furthermore, we were given no specific evidence about when the quarry depth rules were introduced and there was no attempt to establish the extent of quarrying at that time, either by site, area or depth.
205. The proposed QFMS at the McLeans Island sites also differs from the HRGL, but for a different reason. In that case the Applicants consider that the water table has been permanently lowered by quarrying activities, which have diverted groundwater flows into the surface waterbodies. We consider the Applicants are probably on better ground with that assertion.
206. Clearly there is no 'environmental effects' basis to the proposed QFMS levels. The Applicants advised that the proposed QFMS (at each of the three areas) was based on the lowest existing allowable depth of excavation and their desire to not derogate from any existing right. However, we have addressed this above and find that no existing right has been established and therefore any excavation under the City Plan, as a permitted activity could only be to within 1m of highest groundwater.
207. We are concerned that the effects of a predicted 1m rise in groundwater levels at Miners Road will further and more frequently inundate historic poor quality back fill material. We note that the effects of this rise on the existing back fill has not been assessed, nor has this been considered in combination with the measured changes in groundwater quality from existing quarrying activities and the modelled potential effects of these applications. We agree with Dr Scott that the recent groundwater investigations at Miners Road do not provide a full assessment of the magnitude of the existing contamination that could occur from large volumes of fill being periodically inundated and saturated in groundwater.
208. In contrast to the Applicants' approach, the Reporting Officers of both Councils were seeking an environmental effects based QFMS level of 1m above HRGL, in order to avoid inundation of 'shallow' fill and to minimise inundation and saturation of 'deep' fill with groundwater. We were informed by the ECan Reporting Officers that, in this case, HRGL is the same as SHWT (as defined in the LWRP) and that this level, plus 1m for the predicted rise from the CPW scheme (i.e. 2m above the proposed QFMS) was recommended⁹. However, in addition to this, Ms Chapman recommended that the level should be raised a further 1m (i.e. 3m above the proposed QFMS), in order to account for the 1m buffer that is currently required to provide for adequate protection of groundwater quality.

⁹ We note that Dr Scott recommended 1m above the proposed QFMS and made no recommendation on a further 1m for the predicted 1m rises from the CPW scheme.

209. We note that Reporting Officers' recommendations of raising the proposed QFMS level by 2-3m would have serious implications for the Applicants' ability to source enough of the proposed high quality 'deep' fill, which all parties accepted would be in limited supply. We were provided with no evidence as to the effect this would have on extending the duration of the proposed activities and the Applicants have rejected the Reporting Officers' recommendation.
210. We understand that the proposed QFMS level at Miners Road would result in the more contaminated 'shallow' fill, which is to be placed above the QFMS, being inundated whenever the groundwater rises above that level. We note that according to the Environment Canterbury records, this would have occurred at least 6 times in the last 10 years. In light of the agreement between the experts that we should allow for a rise of 1m for the CPW scheme (as part and the existing environment), and in a time of uncertainty about the effects of climate change, we find this frequency of inundation of the lower quality 'shallow' fill to be concerning. In addition, we have no information on the duration of the inundation or the period of time it would remain wet after groundwater levels recede or from rainfall recharge. We therefore share the concerns of Dr Scott, Dr Burbery, Mr English and Mr Watt that this has not been adequately assessed by the Applicants; and the concerns of Dr Gaw, Dr Burbery and Dr Dudley Ward that this adds significant uncertainty to the Applicants assessments.
211. We agree with Dr Scott that the proposed QFMS at Miners Road poses an unacceptably high risk that 'shallow' fill will be periodically inundated by groundwater. Overall, we do not accept that the proposed QFMS levels are sufficient to mitigate the risk posed by the inundation and saturation of 'deep' fill by groundwater, or to avoid inundation and saturation of lower quality 'shallow' fill by groundwater. There is significant uncertainty regarding the frequency and duration of inundation of back fill material and the effect of potential changes on water chemistry and ultimately on contaminant leaching rates and concentrations.
212. On reflection, we agree with Ms Chapman and record that had we decided to grant these consents, we would most likely have adopted the HRGL plus a 1m buffer, as well as a 1m allowance for CPW, as she suggested.

Nature and Quality of the Back Fill

213. The Applicants have revised the definition of 'deep' fill to be more closely aligned with the WasteMINZ Guidelines 2016 and to address concerns raised regarding the need for a WAC based on absolute contaminant concentrations. However, we note that 'deep' fill material includes Class 2, 3 and 4 landfill materials (as defined in the WasteMINZ Guidelines) and would not be considered to be 'inert' or 'cleanfill' (Class 4) material regarded by the Guidelines as suitable for depositing above an unconfined aquifer, let alone directly into the groundwater fluctuation zone.
214. We are particularly concerned that 'shallow' fill could include soil with high levels of organic carbon and other unknown contaminants. We agree with Mr English that without chemical analysis of the material entering the site there is no way of determining the

levels of potential contamination that may be present and hence the potential for groundwater contamination. We agree with the experts in opposition that we simply do not know.

215. We agree with Mr Watt that deterrence and vigilance are the only practical tools for finding and removing unsuitable back fill material. We note there is no 'Chain of Custody' of the fill material and that the operators are reliant on the honesty and integrity of the fill provider with regard to its provenance and likely contamination. We also agree the costs of landfilling at authorised facilities provides a strong incentive to mis-describe material and its origin. We agree with Mr Watt that 'site shopping' and the alarming rates of unauthorised dumping across the greater city area are well recognised.
216. We cannot ignore the risks that occasional inappropriate loads may from time to time be accidentally placed in the excavated area. The proposed management regime is totally reliant on scrupulous observation of rigorous conditions over a very long time, and we consider that is unrealistic, and not consistent with past compliance history, as discussed elsewhere. The evidence suggests this contaminated material will at some time in the future be inundated by groundwater.
217. Mr Williams, for CIAL, submitted that such an adverse effect could occur if contaminated fill was accidentally allowed into the excavated area and that we should take any such '*low probability, high potential impact*' events into consideration. In the event this were to occur, we accept it is likely that any contaminants leaching into the aquifers would be dispersed and diluted by the sheer volume and rapid water movement through the aquifers. However, in this context we are aware that there are shallow domestic drinking water wells very close to the Isaacs Dairy Block site at McLeans Island and very close to the Miners Road, and Selwyn Quarries sites, which could be adversely affected. We are also conscious that the applications cover some 700 ha of the groundwater protection zone.

Evaluation of Water Quality Effects

218. On the basis of the evidence presented, we are not concerned about the possibility of such contamination being detectable at the more distant and deeper Christchurch City Council drinking water bores and the Prison's bores, but cannot completely exclude the possibility at the CIAL bore 800m from the Dairy Block at Aviation Park. Although we accept the CIAL bore is highly unlikely to be adversely affected by the applications, we agree with Dr Humphrey that the risks posed to drinking water supplies cannot be considered to be low, if the consequences of contamination are extremely severe on the community.
219. While we acknowledged the Applicants have improved both the definition of 'deep' fill, and the proposed management and testing of the material throughout the hearing process, we consider the mitigation measures and the proposed QFMS levels fall considerably short of the mark for ensuring adequate protection of groundwater quality.

220. Overall, we concluded the applications are likely to have more than a minor impact on local groundwater users. Given the history at Miners Road of non-compliance with conditions and the reported lack of monitoring and enforcement by the consent authorities, we have little or no confidence in the proposed mitigation conditions for the long term protection of local groundwater quality at any of the application sites. In relation to providing an alternative water supply to domestic bore owners who may be affected by contamination, we consider it would be very hard to prove responsibility for any contamination incident, as demonstrated in the peremptory dismissal in the Applicants' right of reply of the water quality concerns referred to by the McDonaghs. The quarry operators are applying for these consents collectively, as the Canterbury Aggregate Producers Group, but if granted the consents would be held on an individual basis. As the quarries are grouped, except for the Selwyn Quarry, we consider it would be very difficult to identify which operator was responsible for a contamination incident and who would be responsible for providing the alternative water supply.

Ecological Effects

221. We have very little evidence on the potential ecological effects of the applications. The PDP report 2013 entitled '*Functional Significance and Sensitivity of Groundwater Fauna – Te Waihora/Lake Ellesmere Catchment*', the comments of Dr Duncan Grey (Surface Water Scientist with ECan), and the evidence of Dr Fenwick confirm our lack of knowledge of the groundwater fauna and understanding of their role in maintaining existing groundwater quality.

222. We have concluded that the type of back fill (particularly the 'shallow' fill) and the proposed QFMS levels are insufficient to protect existing groundwater quality, and that there is potential for more than minor adverse effects on groundwater quality. We accept the existing back fill operations pose a very real risk to maintaining long term groundwater quality and that this risk will increase if groundwater levels rise as predicted, without digging deeper. Given the uncertainty regarding the biological functioning of the groundwater ecosystem, the potential magnitude of any contaminant leaching and the scale of the proposal (over 700 ha) in the context of the groundwater protection zone, we consider there is potential for more than minor effects on groundwater fauna and the functioning of the groundwater ecosystem.

223. Given our findings on the potential adverse effects on localised groundwater quality, we are also concerned for potential adverse effects on the tributaries of the Ōtukaikino Stream. We note Dr Rutter's evidence that localised existing contamination concentrations could already be toxic to invertebrates. On the basis of the Applicants' modelling and the proximity of sensitive springs to the application sites, we consider there is potential for adverse effects on ecological values in the Ōtukaikino Stream and potentially other lowland streams fed by shallow groundwater that are more than minor. Again this has not been adequately assessed.

Ngāi Tahu Cultural Values

224. Ms Burgman said that the primary concerns of Ngai Tahu related to potential adverse effects on the mauri of water and the disturbance of unknown significant sites. She was

particularly concerned for the protection of the headwaters of the Ōtukaikino Stream and the potential for the activities to degrade water quality given the location of the activities at McLeans Island. She considered that any degradation of existing groundwater quality would affect the mauri of the water and would affect surface water, given that the area is the headwaters of the Ōtukaikino Stream and the area is dotted with rising springs.

225. Given our findings on the potential effects on the local groundwater resource above, the results of the Applicants' groundwater monitoring, and the scale and proximity of the McLeans Island applications, we accept that there is potential for more than minor effects on the mauri of the headwaters of the Ōtukaikino Stream, which is considered wāhi tapu due to its traditional use in the preservation and treatment of important tūpāpaku (deceased).

The Extended Duration of Quarrying Activities at Miners Road

226. The applications, if granted, would enable the quarrying of the existing sites to continue for longer than would otherwise be the case. Various estimates were given for this, ranging from about 5 years for some of the quarry sites, though to Mr English's estimate of 30-40 years. The unknown factor in this would be the availability of the high quality 'deep' fill, which would have to be obtained and stockpiled on-site, to immediately backfill any excavated area when groundwater levels rise. Estimates about availability of this material varied, but all witnesses agreed that it would be the limiting factor and that further exclusions of material deemed unsuitable during the hearing has further reduced the supply. This deficit of suitable material could result in the deep excavations going on intermittently for many years, much to the dismay of the Yaldhurst residents in particular, who have clearly been looking forward to at least some the quarries being worked out in the near future.
227. There was a great deal of anecdotal evidence from residents about the ongoing detraction from amenities for those living close to the quarries from a combination of adverse environmental effect. We note that dust, noise and traffic issues are particularly cited. Ongoing dust problems are apparent, even to casual observation along Old West Coast Rd, and submitters' photographs demonstrate significant deposition of particulate off-site on surrounding properties. The lack of any particular enforcement action perhaps points more to the inability of the Councils to establish exactly who is responsible, than to actual lack of compliance by the operators.
228. Mr Tewnion told us of their experience when a recently consented extension to the Winstone quarry was opened and provided photographs of the dust emissions during site preparation and top soil removal. We are aware from expert evidence presented at other recent hearings that we have been involved in, that the establishment phase is one of the riskiest times for dust emissions, because that is when topsoil is stripped and the perimeter bunds are constructed. For that reason, recent consents have included a suite of conditions to control this phase, notably that construction activities do not take place in windy conditions. We have not seen this consent, but assume it contained such conditions, in common with the other recent examples that we know about. Mr Tewnion told us, however, that construction activities had taken place during strong wind conditions and had resulted in the significant adverse effects and the on-going problems

they now face with their business, as described earlier. He also told us that the residents had contacted ECan officers at the time, but that they had failed to respond. We acknowledge that there can be two sides to any story, but Mr Tewnton's evidence was clear and convincing and accompanied by a set of photographs illustrating his assertions. The Applicant could have responded to this but chose not to do so.

229. We consider this extended duration of a combination of adverse environmental effects is a legitimate 'effect' under the RMA that we are entitled to take into account in considering these applications.
230. We have considered how these concerns may be addressed by a shorter consent duration. However, we are concerned that this would only increase pressure on operators to accept poor quality back fill. Overall, we do not consider this extension of the duration of the combination of environmental effects currently occurring at Miners Road is able to be mitigated. We find that without any certainty of how long the activity may continue for, we must consider the extension may be for as long as 50 years. Overall, we find this to be more than a minor adverse effect on the amenity of the surrounding community.

Positive Effects

231. The Applicants described several positive effects arising from the proposal. These included that continuing to extract aggregates from the existing quarries would be more economical than establishing new quarries, resulting in lower prices to customers and therefore benefitting the entire economy. We accept that this is likely to be true, but we were not given any estimates about how much the savings are likely to be and therefore it is very difficult to assess how much of a benefit this might be. It was also stated that future quarries were likely to be more distant from Christchurch, and that therefore the costs of haulage would increase. We were told that the price of aggregate was likely to double for every additional 30 km travel distance. Several submitters pointed out that could not possibly be correct and that the increased cost have been overstated by the Applicant. We agree.
232. Related to this, was evidence from the Applicants about a likely shortfall in land available for quarrying close to Christchurch, and we were provided with a map in the post-hearing information purporting to show land that may be available. Most of this land is obviously unsuitable, being much too close to the airport and the urban boundary at Yaldhurst. The map also excludes all lands owned by ECan, the CCC, the Crown and land owned by other quarry operators, but we were not told the reason for that exclusion, apart from the limited areas identified for conservation values. The map also appears to stop at the Christchurch City boundary, so omits to show potential land in Selwyn District. By contrast, another map provided by Mr English for the Water Rights Trust, shows large areas of land where applications have been made, and in some cases granted, for exploration or mining permits under the mining legislation, including a very large block of ECan land and most of the very extensive land held by the Crown around the Paparua prison. Mr English did not confine himself to privately owned land and his and other evidence indicates that at least some of the public lands may be available for future quarry operations. We note of course that all such sites would still be subject to applications under the Resource Management Act.

233. We are also aware that a number of other quarries have been established very recently or have been consented, within a similar distance from Christchurch, that other applications for resource consents are pending and that there are unused sites remaining at Miners Road. In addition, submitters responding to our request for further information after the hearing told us that quarry operators have been buying or leasing properties close to Miners Road, although outside the quarry zone, including ECan land. We were also told that gravels are currently being delivered to Christchurch from the very large quarry near Rolleston at a similar price as gravels from Miners Rd, no doubt to remain competitive in the market.
234. For all these reasons we are not particularly convinced by the Applicants' arguments about lack of alternative sites, costs and haul distances, although we do accept that there may be some unquantified cost savings from remaining on existing sites. Overall, we consider we were not provided with enough accurate information about this by the Applicants to be in a position to offset positive effects against adverse effects.

Relevant Statutory Planning Provisions

235. The activity status of the proposal is set under the Christchurch City Plan (**City Plan**) and the Land and Water Regional Plan (**LRWP**). In assessing the applications, we are required under section 104 of the RMA to have regard to the objectives and policies of these plans, and also any other relevant planning documents including National Policy Statements or Environmental Standards.
236. We were provided with analyses of these provisions by the Reporting Officers, Mr Bligh, Ms A. Mackenzie and Ms K. McKenzie.
237. We also note that further decisions on the Proposed Replacement District Plan have been released since the close of the hearing. Of particular relevance to these consents are:
- *Decision 28 on Chapter 8 – Subdivision, Development and Earthworks (part)* - decision notified 27 July 2016, appeal period closed 19 August 2016.
 - *Decision 34 on Chapter 17 – Rural (and relevant definitions)* – decision notified Saturday 20 August 2016. Has legal effect from Monday 22 August. Appeal period closes 16 September 2016.
 - *Decision 35 on Chapter 18 – Open Space (and relevant definitions)* - decision notified Saturday 20 August 2016. Has legal effect from Monday 22 August. Appeal period closes 16 September 2016.
238. We note that the earthworks rules are now treated as operative under section 86F of the Act. However, as they are not fully operative, we must have regard to the objectives and policies of both plans under section 104(1)(b)(vi) (*'any relevant provisions of a plan or proposed plan'*). Accordingly, the proposed plan provisions must be given more weight as a decision has been released and no appeals have been received. We note we must also consider the rule framework under section 104(1)(b)(vi).

239. We note the rural zone rules have legal effect, as a decision has been released, but that they are not beyond challenge until the appeal period closes. We understand that the amended objectives and policies have not yet been made operative. We record we must have regard to the objectives and policies of both plans under section 104(1)(b)(vi), however we consider the proposed plan provisions in the Rural and Open Space Chapters 17 and 18 may be given slightly less weight than the earthworks provisions in Chapter 8 are given because Chapters 17 and 18 are not yet beyond challenge. Again, we note that we must also consider the rule framework under section 104(1)(b)(vi).

240. We note that exactly the same comments apply to the open space rules, as to the rural rules, as decisions 34 and 35 were released and notified on the same dates and the appeal periods both close on 16 September 2016.

241. The zoning of the CAPG sites under the proposed District Plan is as follows:

Application site	City Plan zoning	Proposed District Plan zoning
All application sites in the Miners Road block	Rural Quarry	Rural Quarry
Isaac Construction Company sites at McLeans Island, including the main site at 160 McLeans Island and the Dairy Farm block at 374 McLeans Island	Open Space 3D (Isaac Conservation Park)	Rural Quarry
Fulton Hogan, KB Quarries and the southern three-quarters of the Harewood Gravels site at McLeans Island	Rural 5 (Airport Influences)	Rural Waimakariri
The northern quarter of the Harewood Gravels site at McLeans Island	Open Space 3A (McLeans Island)	Open Space McLeans Island

242. The overall activity status of the applications under the proposed District Plan rules is therefore as follows:

Application site	Proposed District Plan zoning	Activity Status
All application sites in the Miners Road block	Rural Quarry	Non-complying ¹⁰
Isaac Construction Company sites at McLeans Island, including the main site at 160 McLeans Island and the	Rural Quarry	Non-complying ¹¹ (although s.127

¹⁰ Clause 'j' of the definition of 'quarrying activity' states that it may include "quarry site rehabilitation and any associated clean-filling". As the Applicants' proposed fill material does not meet the definition of 'clean fill' the activity is not considered a 'quarrying activity' and therefore defaults to a non-complying activity.

¹¹ Ibid.

Dairy Farm block at 374 McLeans Island		applications have been applied for which are full discretionary)
Fulton Hogan, KB Quarries and the southern three-quarters of the Harewood Gravels site at McLeans Island	Rural Waimakariri	Non-complying ¹² (although s.127 applications have been applied for which are full discretionary)
The northern quarter of the Harewood Gravels site at McLeans Island	Open Space McLeans Island	Non-complying (although s.127 applications have been applied for which are full discretionary)

Christchurch City Plan (City Plan)

2.2 Objective: Water

Maintenance and enhancement of the quality and availability of the City's water resources, and of the natural and cultural values and public accessibility of waterways and their margins.

2.2.1 Policy: Groundwater quality

To ensure land use activities do not detract from the quality or availability of groundwater.

243. All expert witnesses agree that there will be some localised degradation of groundwater quality, within 1 km downgradient of the application sites. They disagree about the extent and significance of that degradation. Tangata whenua consider the proposal will adversely affect the mauri of the headwaters of the Ōtukaikino Stream and impact on their cultural values and their ability to exercise kaitiakitanga. Again, the extent of this could be debateable, but we were told that any degradation of the existing groundwater quality would adversely impact on the mauri of the water from Ngāi Tahu's perspective.
244. The proposal involves the discharge of contaminants directly into the zone of groundwater fluctuation and as such it will degrade, to some extent, from the existing quality of groundwater. The uncertainty regarding the frequency and duration of any direct contact of the 'deep' and 'shallow' fill with groundwater means that potential scale and magnitude of any future leaching of contaminants is unknown.
245. The explanations to both provisions refer specifically to the sites of these applications as being locations where they particularly apply, i.e. west of the city over the unconfined aquifer. We therefore consider they are directly relevant to consideration of the applications.

¹² Ibid.

246. We consider the provisions are very directive and make no allowance for scale, extent or mitigation. At least on a literal basis, the proposal is **contrary** to this objective and policy. However, that is not necessarily fatal to the applications. Extent and significance is relevant to the decision under section 104 and would need to be assessed.

2.2.4 Policy: Surface waters

To manage the location and scale of land use activities and the disposal of stormwater, in a manner which avoids, remedies or mitigates the pollution of surface waters and adverse effects on aquatic ecosystems.

247. The evidence provided was that it would be possible to manage the effects of the land use activities to at least mitigate the extent of the adverse effects, especially by the adoption of an improved quality of 'deep' fill during the course of the hearing. There is no priority for avoiding, remedying or mitigating.
248. We consider the location and scale of the activities have the potential to adversely impact surface water quality of lowland streams and waterbodies, which depend on the existing high groundwater quality to provide spring flow and dilution of pollutants. These surface waters are already suffering from degradation and adverse effects on aquatic ecosystems are evident, particularly lower in the catchments. We consider the applications are inconsistent with this policy.

2.2.7 Policy: Aquatic habitats

To enhance the City's waterways as habitats for fish and other aquatic species and plants.

249. The applications have the potential to adversely affect the natural balance of the groundwater ecosystem, and little is known about stygofauna species and role they play in maintaining and enhancing groundwater quality. The direct connection between shallow groundwater and the surface waters of the Ōtukaikino Stream and spring fed streams such as the Styx and Avon mean that any degradation in existing groundwater quality fails to enhance the City's waterways. The policy is very directive and makes no allowance for scale and extent, or mitigating or remedying. We consider the applications are therefore **contrary** to this policy.

2.4 Objective: Natural features and habitats

The protection and enhancement of key elements and processes comprising the City's natural environment.

250. As with all the provisions above, the objective is very directive and makes no allowance for scale and extent or mitigating or remedying. We consider applications will not protect or enhance the groundwater system and are therefore **contrary** to this objective.

2.4.4 Policy: Ecosystems and habitats

To maintain and enhance the integrity and diversity of natural ecosystems and habitats within the City.

2.4.6 Policy: Biodiversity

To conserve biological diversity by protecting, enhancing and restoring the variety of species which make up this diversity, recognising particular responsibility for indigenous species within that diversity.

251. Again these policies are very directive and makes no allowance for scale and extent, or mitigating or remedying. The applications will not protect, maintain, enhance or restore the integrity of the headwaters of the Ōtukaikino Stream and other spring fed streams in the vicinity of the McLeans Island quarries, or the stygofauna species in the aquifers. We consider the proposal is **contrary** to these policies.

5.1 Objective: Maori and their resources

To recognise the importance of, and provide for, the relationship of Maori, their culture and traditions with ancestral lands, waters, sites, waahi tapu and other taonga.

5.1.2 Policy: Water

To enhance, conserve and facilitate access to significant wetlands, estuaries, coastal areas and waterways.

252. The leaching of contaminants from the placement of fill below the groundwater table is likely to have adverse effects on groundwater and surface water quality. The applications do not recognise the cultural importance of the Ōtukaikino River and its wāhi tapu status. It will not enhance or conserve these waterways. It is therefore considered **contrary** to this objective and policy.

13.1 Objectives: The rural land and soil resource

(a) *That the rural land and soil resource be managed to:*

- *enable rural resources to continue to be used for a variety of rural activities while recognising their operational needs and the potential environmental effects of such activities;*
- *provide scope for the appropriate establishment or extension of urban activities;*
and
- *retain the stability and character of rural soils, and the life supporting capacity of the soil resource, including the potential for primary production, and to safeguard natural values.*

(b) *That the open space character and low density of built form which distinguish the rural area be maintained and enhanced.*

253. The proposal is considered to be **contrary** to that part of the objective which refers to safeguarding natural values, for the reasons stated above.

13.1.9 - 13.1.10 Policies: Mineral extraction

13.1.9 - To ensure that mineral extraction is confined:

- (a) *to locations previously allocated for mineral extraction purposes, or within or adjacent to the Waimakariri River;*
- (b) *in the case of sand, to areas remote from settlement and where erosion risk can be mitigated.*

13.1.10 - To ensure provision is made for reducing the associated adverse effects of mineral extraction, and rehabilitating worked out areas for activities compatible with the surrounding rural environment.

254. The proposal is not within the locations specified above. It will not reduce adverse effects of mineral extraction on the subject site. We consider the applications are therefore **contrary** to Policy 13.1.9 and are inconsistent with Policy 13.1.10.

13.2 Objective: Water resources

Management of land use activities to protect the quality and availability of both surface and groundwater in the rural area of the City.

255. This objective is directly relevant to the protection of groundwater quality for rural users. The proposal will not protect the quality of groundwater in the rural area surrounding the application sites. We have concluded that the adverse effects on shallow (less than 60m) groundwater users within 500m of the application sites is likely to be more than minor. The wording is directive and absolute. The objective does not refer to drinking water standards and protection of the existing groundwater quality is clearly the intention of the policy. Therefore, the applications are **contrary** to this objective.

13.2.1 Policy: Groundwater recharge

To ensure that land use activities do not risk contamination of the groundwater recharge area, by controlling activities involving major use or production of potential contaminants, rural dwellings, unserviced urban activities and landfilling.

256. This policy is the most directly relevant to the sites of these applications. By allowing for both 'deep' fill and some of the lower quality 'shallow' fill to be inundated periodically by groundwater, it will not be possible to avoid all risk of contamination of the groundwater recharge area. The language is directive and absolute and makes no provision for mitigation or remedying adverse effects, or allowing for minor or less than minor effects. The applications are **contrary** to this policy.

14.4 Objective: Adverse environmental effects

That the establishment or development of open space and recreational facilities is undertaken in a manner which enables adverse effects on amenity values to be avoided, mitigated or remedied.

257. The Isaacs sites are within the Open Space 3D zone and therefore subject to this policy. Although Ms Chapman considers the proposal to be contrary to this objective, her reasons for this relate to the words 'careful management of adverse effects', which appear in the reasons for the objective rather than the objective itself. The objective itself allows for avoiding or remedying, so we do not consider the proposal contrary to it.

14.4.5 Policy: Mineral extraction

To ensure the adverse effects of mineral extraction in the Isaac Conservation Park are avoided, remedied or mitigated, and in particular that quarried areas are rehabilitated so

that they are suitable for activities compatible with the surrounding open space environment, and that amenity is enhanced.

258. As the policy allows for avoiding, remedying or mitigating of adverse effects we do not consider the proposal contrary to it.

14.5 Objective: Airport Operations *Development within Open Space zones is of a scale and character consistent with the safe and efficient use and development of Christchurch International Airport.*

14.5.2 Policy - bird strike issues

To ensure development within Open Space zones takes into account the potential to adversely affect Christchurch International Airport Operations in respect of bird strike.

259. On the basis of the evidence, we accept that the risk of bird strike from these operations is low and can be managed by imposition of appropriate conditions. We also consider that the airport's water supply wells (except for the closer well at Aviation Park) are too far from the applications sites (approximately 1.5km) to be contaminated by the back filling activities. We therefore conclude that the proposal is not contrary to these provisions.

Operative Christchurch Replacement District Plan

3.3.1 Objective - Enabling recovery and facilitating the future enhancement of the district *The expedited recovery and future enhancement of Christchurch as a dynamic, prosperous and internationally competitive city, in a manner that:*

- a. Meets the community's immediate and longer term needs for housing, economic development, community facilities, infrastructure, transport, and social and cultural wellbeing; and*
- b. Fosters investment certainty; and*
- c. Sustains the important qualities and values of the natural environment.*

260. We accept that the proposal meets the first part of this objective, but that it does not achieve sub clause (c). As all the clauses are intended to work together we find that the proposal is **contrary** to this objective.

3.3.3 Objective - Ngāi Tahu Manawhenua *A strong and enduring relationship between the Council and Ngāi Tahu Manawhenua in the recovery and future development of Ōtautahi (Christchurch City) and the greater Christchurch district, so that:*

- a. Ngāi Tahu Manawhenua are able to actively participate in decision-making; and*
- b. Ngāi Tahu Manawhenua's aspirations to actively participate in the revitalisation of Ōtautahi are recognised; and*
- c. Ngāi Tahu Manawhenua's culture and identity are incorporated into, and reflected in, the recovery and development of Ōtautahi; and*
- d. Ngāi Tahu Manawhenua's historic and contemporary connections, and cultural and spiritual values, associated with the land, water and other taonga of the district are recognised and provided for; and*
- e. Ngāi Tahu Manawhenua can retain, and where appropriate enhance, access to sites of cultural significance.*

f. Ngāi Tahu Manawhenua are able to exercise kaitiakitanga.

261. As the Ngāi Tahu is strongly opposed to the applications, we accept they are **contrary** to this objective.

3.3.5 Objective - Business and economic prosperity

The critical importance of business and economic prosperity to Christchurch's recovery and to community wellbeing and resilience is recognised and a range of opportunities provided for business activities to establish and prosper.

262. We accept that the proposal would achieve this objective. However, we consider business and economic prosperity, and community wellbeing depend on the protection of existing groundwater quality.

3.3.9 Objective - Natural and cultural environment

A natural and cultural environment where:

- a. People have access to a high quality network of public open space and recreation opportunities, including areas of natural character and natural landscape; and*
- b. Important natural resources are identified and their specifically recognised values are appropriately managed, including:*
 - i. outstanding natural features and landscapes, including the Waimakariri River, Lake Ellesmere/Te Waihora, and parts of the Port Hills/Nga Kohatu Whakarakaraka o Tamatea Pokai Whenua and Banks Peninsula/Te Pātaka o Rakaihautu; and*
 - ii. the natural character of the coastal environment, wetlands, lakes and rivers, springs/puna, lagoons/hapua and their margins; and*
 - iii. indigenous ecosystems, particularly those supporting significant indigenous vegetation and significant habitats supporting indigenous fauna, and/or supporting Ngāi Tahu Manawhenua cultural and spiritual values; and*
 - iv. the mauri and life-supporting capacity of ecosystems and resources; and*
- c. Objects, structures, places, water/wai, landscapes and areas that are historically important, or of cultural or spiritual importance to Ngāi Tahu Manawhenua, are identified and appropriately managed.*

263. As Ngāi Tahu Manawhenua regard the tributaries of the Ōtukaikino Stream as wāhi tapu and are strongly opposed to these applications, we accept they are **contrary** to this objective.

3.3.12 Objective - Infrastructure

- a. The social, economic, environmental and cultural benefits of infrastructure, including strategic infrastructure, are recognised and provided for, and its safe, efficient and effective development, upgrade, maintenance and operation is enabled; and*
- b. Strategic infrastructure, including its role and function, is protected by avoiding adverse effects from incompatible activities, including reverse sensitivity effects, by, amongst other things:*
 - i.*
 - iv. managing the risk of bird strike to aircraft using Christchurch International Airport; and*

C.

264. Christchurch International Airport is part of the strategic infrastructure of Canterbury. Adverse effects on the Airport could include contamination of its drinking water bores, and increase risk of bird strike. We have concluded that the risk of both is very low and therefore the applications are consistent with this objective.

3.3.14 Objective - Incompatible activities

a. The location of activities is controlled, primarily by zoning, to minimise conflicts between incompatible activities; and

b. Conflicts between incompatible activities are avoided where there may be significant adverse effects on the health, safety and amenity of people and communities.

265. There is the potential for incompatibility between the quarries and nearby rural-residential neighbours, particularly if there is contamination of local groundwater bores. While effects are likely to be aesthetic rather than health-related, this can be regarded as an effect on amenity. Such effects are likely to be objectionable and unacceptable to affected neighbours, and while more than a minor effect, on the basis of the evidence, would probably not be 'significant'. We have also concluded that the extended duration of a combination of existing adverse effects is also more than minor, but again we have not assessed whether these are likely to be significant. Therefore, the applications are not contrary to this objective.

Proposed Replacement District Plan

3.3.16 Objective — A productive and diverse rural environment

a. A range of opportunities is enabled in the rural environment, primarily for rural productive activities, and also for other activities which use the rural resource efficiently and contribute positively to the economy.

b. The contribution of rural land to maintaining the values of the natural and cultural environment, including Ngai Tahu values, is recognised.

266. We consider the proposals to be consistent with clause (a) and **contrary** to clause (b) of this objective.

8.1.4 Objective - Earthworks

a. Earthworks facilitate subdivision, use and development, the provision of utilities, hazard mitigation and the recovery of the district.

267. The proposals would be consistent with this objective

8.1.4.1 Policy - Water Quality

a. Ensure earthworks do not result in erosion, inundation or siltation, and do not have an adverse effect on surface water or groundwater quality.

268. The policy is directive and makes no allowance for scale and extent. The proposals are **contrary** to this policy.

8.1.4.3 Policy – Benefits of earthworks

a. Recognise that earthworks are necessary for subdivision, use and development, the provision of utilities, hazard mitigation and the recovery of the district

269. The proposals would be consistent with this policy

8.1.4.5 Policy - Protection of wahi tapu and wahi taonga

a. For land use consent applications for earthworks within or adjacent to sites of Ngāi Tahu cultural significance and silent file areas, ensure that consultation has occurred with the appropriate rūnanga.

270. We understand that some amount of consultation has occurred so the applications are consistent with this rather weak policy.

9.1.1.1 Objective: Indigenous Biodiversity and Ecosystems

Indigenous biodiversity is maintained and enhanced and areas of significant indigenous vegetation and significant habitats of indigenous fauna are identified and protected.

271. Little is known about indigenous stygofauna in the aquifers and the effects of localised chemical changes are also unknown. We have evidence suggesting endemic indigenous stygofauna species are present within the groundwater system. Given localised groundwater quality will be degraded, and not maintained and enhanced, the applications are likely to be **contrary** to this objective.

11.1.1 Objective: Provision of utilities

- 1. Effective and efficient provision of utilities in a manner that is integrated with land use and development in the District.*
- 3. An increase in appropriate renewable electricity generation activities.*

11.1.1.2 Policy: Security of supply

To recognise the national, regional and local benefits of secure utilities by enabling the operation, maintenance, and upgrading of utilities.

11.1.2 Objective: Adverse effects

Avoid, remedy or mitigate the adverse effects of utilities on other activities and the adverse effects of other activities on utilities while providing for the diverse nature and specialised character of utilities.

11.1.2.2 Policy: Adverse effects on utilities

Avoid adverse effects on utilities from other activities, including reverse sensitivity effects that may compromise their development, operation, upgrading and maintenance of utilities.

272. The two utilities that could be adversely affected are the Transpower electricity transmission system and the Christchurch City and Airport water supplies. We consider the adverse effects on the electricity system and the aviation safety can be avoided by conditions. We have concluded that the risk to the public water supplies is very low, but that the potential social and economic impact of any contamination of drinking water

supplies would be highly significant. We have no confidence in the proposed mitigation regime. We do not accept that the applications avoid adverse effects that may compromise community drinking supplies. In our view, adverse effects can be avoided by not exposing groundwater in the base of the pits, not placing back fill material into the groundwater zone and by leaving a 1m buffer of undisturbed aggregate. For this reason, we consider the applications are consistent with Objective 11.1.2, inconsistent with Policy 11.1.1.2 and **contrary** to Objective 11.1.2 and Policy 11.1.2.2.

17.1.1 Objective — The rural environment

a. Subdivision, use and development of rural land that:

- i. supports, maintains and, where appropriate, enhances the function, character and amenity of the rural environment and, in particular, the potential contribution of rural productive activities to the economy and wellbeing of the district;*
- ii. avoids significant, and remedies or mitigates other reverse sensitivity effects on rural productive activities and natural hazard mitigation works;*
- iii. maintains a contrast to the urban environment; and*
- iv. maintains and enhances the distinctive character and amenity of Banks Peninsula and the Port Hills, including indigenous biodiversity, Ngai Tahu cultural values, open space, natural features and landscapes, and coastal environment values.*

273. All parts of this objective apply together. There is no hierarchy between them. The proposals would be consistent with sub-clauses (i)-(iii) and **contrary** to (iv), as they fail to maintain and enhance Ngāi Tahu cultural values. The applications are therefore overall **contrary** to this objective.

17.1.1.1 Policy — Range of activities on rural land

a. Provide for the economic development potential of rural land by enabling a range of activities that:

- i. have a direct relationship with, or are dependent on, the rural resource, rural productive activity or sea-based aquaculture;*
- ii. have a functional, technical or operational necessity for a rural location; or*
- iii. recognise the historic and contemporary relationship of Ngai Tahu with land and water resources; and*
- iv. represent an efficient use of natural resources.*

274. Curiously, the three sub-clauses are not all conjunctive. As the applications would be consistent with (i) (ii) and (iv) they would be consistent with this policy even though they fail to recognise the relationship of Ngai Tahu with land and water. In this regard we think this policy is inconsistent with its overarching objective and accordingly give more weight to the objective. In fact, we have difficulty understanding how the policy intends to deal with the Ngai Tahu relationship. The “or” at the end of (ii) seems redundant or contradictory if the policy is intended to implement Objective 17.1.1

17.1.1.2 Policy — Effects of activities utilising the rural resource

a. Ensure that activities utilising the rural resource avoid significant adverse effects on areas of important natural resources and avoid, remedy or mitigate other adverse effects on rural character and amenity values.

275. For the reasons described in our assessment of effects, we consider the quarries are already having adverse effects on the rural character and amenity enjoyed by neighbours at Miners Road. Extending and prolonging the activities there would not avoid remedy or mitigate these effects, so the applications in the Miners Road area are **contrary** to this policy.

17.1.1.3 Policy — Contributing elements to rural character and amenity values

- a. *Recognise that rural character and amenity values vary across the district resulting from the combination of natural and physical resources present, including the location and extent of established and permitted activities.*
 - b. *Recognise that the elements that characterise an area as rural, from which desired amenity is derived, include the predominance of:*
 - i. *a landscape dominated by openness and vegetation;*
 - ii. *significant visual separation between residential buildings on neighbouring properties;*
 - iii. *where appropriate, buildings integrated into a predominantly natural setting; and*
 - iv. *natural character elements of waterways, water bodies, indigenous vegetation and natural landforms, including the coastal environment where relevant.*
 - c. *Recognise that rural productive activities in rural areas can produce noise, odour, dust and traffic consistent with a rural working environment, including farming, plantation forestry and quarrying, that may be noticeable to residents and visitors in rural areas*
276. The applications are considered to be consistent with this objective and policy.

17.1.1.4 Policy — Function of rural areas

- a. *Ensure the nature, scale and intensity of subdivision, use and development recognise the different natural and physical resources, character and amenity values, conservation values and Ngai Tahu values of rural land in the district, including:*
 - i. *the rural productive, recreation, tourism and conservation activities on Banks Peninsula and their integrated management with maintaining and enhancing landscape, coastal and indigenous biodiversity values;*
 - ii. *the rural productive and recreation activities in the rural flat land area surrounding the main Christchurch urban area;*
 - iii. *the flood management and groundwater recharge functions adjoining the Waimakariri River;*
 - iv. *the open character and natural appearance of the rural Port Hills which maintain distinct urban/rural boundaries*
 - v. *the re-use of the site of the former Templeton Hospital;*
 - vi. *the historic and contemporary cultural landscapes, sites of Ngai Tahu cultural significance and the use of land and water resources for mahinga kai; and*
 - vii. *the conservation activities undertaken within the Peacock Springs Conservation Area.*
277. Because of the adverse effects on Ngāi Tahu cultural values the applications, at least at McLeans Island, would be **contrary** to this policy.

17.1.1.10 Policy — Separation of incompatible activities

- a. *Ensure the design and location of new habitable buildings achieve adequate separation distances or adopt other on-site mitigation methods, including acoustic insulation, to*

- mitigate potential reverse sensitivity effects with lawfully established rural productive activities;*
- b. *Ensure adequate separation distances between new plantation forestry, intensive farming and quarrying activity and incompatible activities are maintained.*
- c. *Protect strategic infrastructure by avoiding adverse effects, including reverse sensitivity effects, from incompatible activities on rural land by:*
- i. *avoiding noise sensitive activities and managing the density of residential units within the 50dB Ldn Air Noise Contour to take into account the impacts of the operation of Christchurch International Airport;*
[This provision may be reconsidered by the Hearings Panel following the decision on Chapter 6 General Rules]
- ii. *avoiding buildings, structures, new quarrying activity, and sensitive activities on rural land that may compromise the National Grid within an identified buffer corridor; and*
- iii. *avoiding vegetation that may result in shading and buildings in close proximity to the strategic transport network.*
- iv. *avoiding new quarrying activity that would have adverse effects on established Radio New Zealand infrastructure.*
278. We consider that because of the localised effects on groundwater the applications are **contrary** to part (b) of this policy and therefore the policy as a whole.

17.1.1.11 Policy — Catchment management approach for rural land

- a. *Encourage integrated subdivision and development on rural land at a catchment level that implements the principles of ‘ki uta ki tai’, maintains or enhances water quality, maximises the degree of openness and protects productive potential and enables biodiversity enhancement or recreation opportunities while avoiding, remedying or mitigating adverse effects on the rural environment.*
279. We consider the applications do not implement the principles of the ki uta ki tai concept, or maintain and enhance water quality. They are therefore **contrary** to this objective.¹³

17.1.1.12 Policy — Location and management of quarrying activity and aggregates-processing activity

- a. *Enable access to, and processing of, locally sourced aggregate resources to provide for the recovery, development, ongoing maintenance and growth needs of the district by:*
- i. *providing for the continuation of quarrying activity in the Rural Quarry Zone; and*
- ii. *providing for new quarrying activity in rural zones other than the Rural Quarry Zone only where the activity:*
- A. *avoids areas of outstanding or significant landscape, ecological, cultural or heritage value;*
- B. *avoids or mitigates effects on activities sensitive to quarrying including residential and education activities;*

¹³ ‘Ki uta ki tai’ is a philosophy that reflects the Ngāi Tahu view of environmental and resource management. It is a traditional concept representing kaitiakitanga (guardianship) from the mountains and great inland lakes, down the rivers to hāpua/lagoons, wahapū/estuaries and to the sea. Kaitiakitanga reflects the special relationship Ngāi Tahu has with its environmental heritage. It is fundamental to the tribe’s culture and identity. Ki uta ki tai encapsulates the need to recognise and manage the interconnectedness of the whole environment. Source: <http://tewaihora.org/ki-uta-ki-tai/>

- C. internalises adverse environmental effects as far as practicable using industry best practice and management plans, including monitoring and self-reporting;*
 - D. manages noise, vibration, access and lighting to maintain local rural amenity values;*
 - E. avoids or mitigates any effects on surface water bodies and their margins; and*
 - F. ensures the siting and scale of buildings and visual screening maintains local rural amenity and character.*
- iii. *providing for new quarrying activity in the Rural Quarry Templeton*
- iv. *providing for aggregates-processing activity in the Rural Quarry Zone where the activity:*
- A. makes efficient use of established, large-scale processing infrastructure and facilities; and*
 - B. does not result in additional or more intensive adverse effects (beyond those associated with quarrying activity) for residents in adjoining zones, including from lighting, noise and traffic generation.*
280. We recognise that this policy could seem to be very specific to the activities proposed in these applications. We note that the definition of 'quarrying' includes associated back filling with 'cleanfill' and that the proposed back fill does not comply with the definition of 'cleanfill'. Therefore, strictly speaking the proposals do not qualify as quarrying for the purposes of the plan. If it was applicable, the applications would be consistent with this policy as it specifically excludes additional or more intense effects resulting from quarrying.

17.1.1.13 Policy — Quarry site rehabilitation

- a. Ensure quarry sites, and sites of aggregates-processing activities, are rehabilitated to enable subsequent use of the land for another permitted or consented activity; and*
 - b. Require proposals for new quarries, aggregates-processing activities and changes of use on existing quarry sites to demonstrate through a quarry site rehabilitation plan the objectives, methodology and timescales for achieving site rehabilitation and appropriate end use; and*
 - c. Ensure the final rehabilitated landform is appropriate having particular regard to:*
 - i. the intended end use;*
 - ii. the location, gradient and depth of excavation;*
 - iii. the availability of clean fill material, including top soil, and consequent timeframes for rehabilitation;*
 - iv. the surrounding landform and drainage pattern;*
 - v. the ability to establish complete vegetation cover;*
 - vi. the outcomes of any consultation undertaken with manawhenua; and*
 - vii. any adverse effects associated with rehabilitation.*
281. With the imposition of suitable conditions, we consider the applications could be consistent with this policy.

Canterbury Regional Policy Statement

Objective 5.2.1: Location, design and function of development (Entire Region)

Development is located and designed so that it functions in a way that:

(1)

- (2) enables people and communities, including future generations, to provide for their social, economic and cultural well-being and health and safety; and which:
- (a) maintains, and where appropriate, enhances the overall quality of the natural environment of the Canterbury region, including its coastal environment, outstanding natural features and landscapes, and natural values;
 - (b)
 - (c) encourages sustainable economic development by enabling business activities in appropriate locations;
 - (d)
 - (e) enables rural activities that support the rural environment including primary production;
 - (f) is compatible with, and will result in the continued safe, efficient and effective use of regionally significant infrastructure;
 - (g) avoids adverse effects on significant natural and physical resources including regionally significant infrastructure, and where avoidance is impracticable, remedies or mitigates those effects on those resources and infrastructure;
 - (h)
 - (i) avoids conflicts between incompatible activities.

282. The applications are consistent with clause (2)(e) of this policy, but are not consistent with the rest of the relevant clauses as they do not:
- (i) enable people and communities, including future generations, to provide for their health and safety
 - (ii) maintain the overall quality of the natural environment of the Canterbury region, including natural values
 - (iii) avoid adverse effects on significant natural and physical resources
 - (iv) avoid conflicts between incompatible activities.
283. Overall, we assess the applications as being **contrary** to this policy.

Objective 6.2.1: Recovery framework

Recovery, rebuilding and development are enabled within Greater Christchurch through a land use and infrastructure framework that:

(1-4)....

(5) protects and enhances indigenous biodiversity and public space;

(6) maintains or improves the quantity and quality of water in groundwater aquifers and surface water bodies, and quality of ambient air;

(7) maintains the character and amenity of rural areas and settlements;

284. While the applications are certainly consistent with recovery and rebuilding of Greater Christchurch, this objective calls for that to be done in a way which safeguards key values, which we consider the proposal does not achieve particularly well. The language is directive, requiring these values to be protected, enhanced, improved or at least maintained. Overall we assess the proposal as **contrary** to this objective.

Objective 6.2.3: Sustainability

Recovery and rebuilding is undertaken in Greater Christchurch that:

- (1) *provides for quality living environments incorporating good urban design;*
- (2) *retains identified areas of special amenity and historic heritage value;*
- (3) *retains values of importance to Tangata Whenua;*
- (4) *provides a range of densities and uses; and*
- (5) *is healthy, environmentally sustainable, functionally efficient, and prosperous.*

285. We consider the applications are **contrary** to subclause (3) and possibly subclause (5).

Objective 7.2.3: Protection of intrinsic value of waterbodies and their riparian zones

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 fresh water ecosystems are safeguarded.

286. Quality of freshwater in the near vicinity of the quarries will not be maintained and improved, but the objective calls for water quality to be maintained overall. The effects are expected to be localised, so overall water quality in the wider groundwater system is not likely to be affected. However, we remain concerned for the tributaries of the Ōtukaikino Stream given the location of the McLeans Island quarries and the direct and close connection with groundwater. Given these concerns and the potential for localised effects on the groundwater ecosystem, we consider the applications are **contrary** to this objective.

Policy 7.3.1 – Adverse effects of activities on the natural character of fresh water

To identify the natural character values of fresh water bodies and their margins in the region and to:

- (1) *preserve natural character values where there is a high state of natural character;*
- (2) *maintain natural character values where they are modified but highly valued; and*
- (3) *improve natural character values where they have been degraded to unacceptable levels; unless modification of the natural character values of a fresh water body is provided for as part of an integrated solution to water management in a catchment in accordance with Policy 7.3.9, which addresses remedying and mitigating adverse effects on the environment and its natural character values.*

287. The water in the aquifers and the Ōtukaikino Stream have high natural character which the applications do not preserve. The language is directive. The applications are therefore **contrary** to this policy.

Objective 9.2.1: Halting the decline of Canterbury’s ecosystems and indigenous biodiversity

The decline in the quality and quantity of Canterbury’s ecosystems and indigenous biodiversity is halted and their life-supporting capacity and mauri safeguarded.

288. The applications could adversely affect stygofauna in the aquifers in the vicinity of the deepened quarries, if there is excessive of organic carbon in the ‘deep’ fill. The extent of the adverse effect is unknown because so little is known about stygofauna and their role, but the applications cover a relatively large area of the groundwater protection zone and will certainly not halt any decline in the quality of the groundwater ecosystem. Ngāi Tahu consider the any degradation of groundwater quality will not safeguard the mauri of

water. The objective is directive and makes no allowance for scale and extent. The applications are therefore **contrary** to this objective.

Canterbury Land and Water Regional Plan (LWRP)

289. There are two levels to the LWRP. 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. We consider the following provisions are most relevant to the proposal.

Objective 3.1

Land and water are managed as integrated natural resources to recognise and enable Ngāi Tahu culture, traditions, customary uses and relationships with land and water.

290. We consider the applications would only be consistent with the relevant policies and objectives in the Mahaanui Iwi Management Plan (2013) if the mitigation and management procedures proposed were observed carefully by the Applicants and enforced by ECan. However, we have reservations that the proposed suite of conditions would always be rigorously observed 100 percent of the time over possibly several decades. Past performance indicates poor compliance and enforcement. There is a high risk that occasional loads of contaminated materials would be deposited undetected given the reliance on visual assessments, the honesty and integrity of contractors and lack of a 'chain of custody'. This would ultimately result in the leaching of unknown contaminants in unknown concentrations into shallow groundwater which directly feeds the headwaters of the Ōtukaikino Stream, which is regarded as wāhi tapu. We accept that because of the high volume and flow rates of the aquifers in this vicinity, any contamination effects may unmeasurable more than 1 km from the sites. However, the application sites sit within the headwater system and the surface waters are directly dependent on large volumes of high quality groundwater to maintain their life supporting capacity. On the basis of the evidence presented by Ngāi Tahu, we do not consider that the applications give effect to this objective and therefore are technically **contrary** to it.

Objective 3.8A

High quality fresh water is available to meet actual and reasonably foreseeable needs for community drinking water supplies.

291. With regards to Objective 3.8A, we do not consider it likely that the applications will adversely affect the availability of fresh water for Community Drinking Water supplies. As Dr Scott states "*Most of the city's public water supplies are sourced from deep wells several kilometres away from the quarry sites. It is unlikely that contaminants from the CAPG sites would be transported over these distances at high enough concentrations to cause problems requiring water treatment*". As shown from the GIS audits of the site, there are a few small community takes to service the drinking water needs of Christchurch Prison and Christchurch International Airport. However, these are also considered to be at low risk due to their location and depth. Overall, we accept that no community drinking water supply bores are likely to exceed MAV drinking water standards, as a result

of the applications. Therefore, the applications are considered to be consistent with this objective.

Objective 3.13:

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.

292. The Applicants have suggested a range of site management, back fill management and groundwater monitoring methods with the intention of avoiding and mitigating any potential adverse effects on groundwater quality, as discussed above. Subject to management and compliance with the proposed conditions, we consider the applications would be consistent with this objective. However, as noted we have reservations that the conditions would always be rigorously observed, and consider that some of the proposed mitigation conditions are unworkable. This has the potential to create adverse effects for individual wells relied on by neighbouring property owners. The Applicants consider that such effects would probably not exceed health and aesthetic standards in the New Zealand Drinking Water Standards, but as demonstrated at the hearing by Mr and Mrs McDonagh, these standards do not necessarily result in an acceptable water quality in all respects.
293. The Applicant's assessments indicate that the applications pose a contamination risk to localised groundwater users with shallow bores (less than 60m) within 1 km downgradient of the sites. The Applicants have failed to identify all such domestic supply bores and to provide sufficient mitigation in the event these are adversely affected. The applications are therefore considered to be **contrary** to this objective.

Objective 3.24:

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.

294. Current consents held by the individual quarry operators who form CAPG were granted between 1997 and 2014, prior to cleanfill guidance from the MfE and vary a great deal in terms of consent conditions and the quality of the material. These applications would allow for a more consistent and updated cleanfill management and groundwater monitoring regime across ten quarry sites in the three locations. Therefore, we consider the granting of these consents may allow for an improved environmental outcome than what is occurring currently. As discussed above, the likelihood of the effect is directly related to the management of the sites and compliance with conditions as recommended. We also note that a number of the quarries, particularly at Miners Road are close to worked out and only one has a significant remaining life, so this opportunity may be more apparent than real. Therefore, we consider the applications are inconsistent with, but not contrary to this objective.

Strategic Policy 4.4 (e):

Groundwater is managed so that: ...

(h) Overall water quality in aquifers does not decline.

295. As discussed above and in Dr Scott's evidence, there is a moderately high risk that there could be adverse aesthetic effects on groundwater supplying neighbouring residences. The Applicants have suggested remediation options in the event of groundwater contaminants (both aesthetic and human health determinants) breach MAVs or GVs of the DWSNZ. Given any adverse effects on existing groundwater quality is expected to be localised, and this policy applies to the quality of groundwater in the aquifer overall, the ECan Reporting Officers considered the proposal to not be inconsistent with this policy.
296. If that is the case, and it may well be, our only comment would be that this is not a very useful clause, as it would appear on that interpretation to allow for localised contamination of shallow aquifers provided that the overall water quality in the aquifer did not decline. Therefore, the applications may be consistent with this policy, but it is a very low hurdle to overcome.

Policy 4.7:

Resource consents for new or existing activities will not be granted if the granting would cause a water quality or quantity limit set in section 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.*

297. The ECan Reporting Officers advised that because there are no water quality limits set in the Christchurch West Melton or Selwyn–Waihora sub-regional chapters, the limits set out in Schedule 8 apply. Schedule 8 requires contaminants of health significance listed in the DWSNZ to be less than 50 percent of MAV. The Applicants have proposed that 50 percent of MAV, in the downgradient water supply wells, is to be used a trigger for additional monitoring requirements, investigations, and if further samples fail to meet drinking water standards, that an alternative water supply strategy will be implemented. Using the 50 percent of MAV as a trigger point means there is a possibility the limits in Schedule 8 will be breached and be exceeded for a certain period of time, although the structure of the recommended groundwater monitoring conditions is aimed at ensuring these limits are not breached in the long-term. However, it would be virtually impossible to do anything about this as it would not be possible to identify or remove any source of the contaminated material. The suggested mitigation of providing alternative water supplies to affected neighbours would not make the proposal compliant with this policy as it would do nothing to phase out the non-compliance. We therefore consider the applications are **contrary** to this policy.

Activity and Resource Policies

Policy 4.23:

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 group 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.

298. The ECan Reporting Officers reported that the initial focus of this policy is on all sources of drinking water, including domestic supply wells. The evidence of Dr Scott highlighted that groundwater monitoring undertaken at the quarry sites and recent investigations at Miners Road had shown elevated concentrations of aesthetic determinants of groundwater quality. We note that the predicted increase in groundwater levels at Miners Road could increase these effects by inundating historical poor quality back fill material.
299. We consider it is likely the proposed deeper back filling would cause further changes in water chemistry, leading to increased leaching of contaminants and compounding existing exceedances in the aesthetic qualities of local groundwater quality. While the Applicants have proposed a range of management measures to be followed during excavations and back filling to mitigate the risks on groundwater quality, in our view the proposed QFMS level does not sufficiently avoid inundation of 'shallow' fill or minimise inundation of 'deep' fill.
300. The policy appears to be not concerned with just significant actual and potential adverse effects. 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. We do 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, we consider the proposal is **contrary** to the first limb of this policy, while the second limb is not relevant.

Policy 4.93:

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.

301. Policy 4.93 intends to recognise the value of gravel extraction for construction and maintenance of infrastructure, for economic activity and for the re-build of Christchurch. We consider the applications give effect to this policy.

Policy 4.94:

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.

302. We note that the intention of this policy is to minimise any adverse effects or the risk of any adverse effects. The policy does not specify significant effects, but deals with any adverse effects.

303. As discussed by Dr Scott, the ability to dig deeper represents an increased risk to groundwater quality over that which is currently occurring. We consider that the adverse effects on local groundwater users, which may occur from time to time or over time, would not be less than minor.
304. As we have discussed above, we do not accept that the proposed management or conditions of consent sufficiently mitigate adverse effects on local groundwater users and do not give effect to this policy. We therefore consider the applications are **contrary** to this policy.

Section 9 of the LWRP – Christchurch West Melton

305. Section 9 of the LWRP sets policies specific to the Christchurch-West Melton Zone under the CWMS. The following policy is considered most relevant to the proposed activities at the site for the McLeans Island and Yaldhurst quarries:

Policy 9.4.1:

Protect the high quality, untreated groundwater sources available to Christchurch City as a potable water supply in the area shown on the Planning Maps as the Christchurch Groundwater Protection Zone by:

- a) Ensuring any abstraction of groundwater maintains upward hydraulic pressure gradients of groundwater where this pressure exists;*
 - b) Controlling the use of land where activities involve the aggregation of large quantities of hazardous substances to ensure risks of spill, leaching or other contamination of groundwater are appropriately mitigated;*
 - c) Preventing new landfills or any expansion of existing landfill disposal areas, except for the disposal of inert fill or clean fill only; and*
 - d) Ensuring any land uses maintain an overlying confining layer above the aquifer of at least 3 m thickness, or where the confining layer is less than 3 m thick, maintain the existing thickness of the confining layer. Where the confining layer is removed or reduced, including as part of site construction or gravel or mineral extraction, measures are put in place to mitigate the risk of contaminants from land uses entering groundwater once site construction or excavation ceases and any remaining excavations are rehabilitated using inert fill.*
306. Sub-clause (a) is not relevant as the application sites are not in areas where there is upwards pressure and the activities does not involve water abstraction. Sub-clause (b) is not relevant as large quantities of hazardous substances will not be present. We accept that refuelling operations can be conducted safely, and while there is the possibility of spills and leaks of hydraulic fluids, we accept that the proposed spill protocols and limiting machinery operations near groundwater will ensure any such effects would be less than minor provided a buffer of 1m of undisturbed material is maintained. We do not consider a 0.3m buffer proposed for McLeans Island or the 0.5m proposed for Selwyn Quarries to be adequate for spill response, or to avoid and mitigate the risk of bacterial contamination of groundwater. Sub-clause (d) is not relevant as there is no existing confining layer at these sites.
307. The Applicants are proposing to dispose of ‘cleanfill’ and natural strata at the quarry sites. However, the ‘shallow’ and ‘deep’ fill would not be regarded as ‘cleanfill’ (Class 4) under the WasteMINZ Guidelines 2016, which have replaced the Ministry for the Environment’s

Cleanfill Guidelines 2002. Even the proposed 'deep' fill would contain material from Class 2, 3 and 4 land fill types. This is not considered to be 'clean fill' or 'inert fill' material and therefore the applications are **contrary** to this policy.

Section 11 of the LWRP – Including Plan Change 1

308. Section 11 of the LWRP set policies specific to the Selwyn – Waihora Zone under the Canterbury Water Management Strategy. The policy discussed below is most relevant to the Selwyn quarry site.

Policy 11.4.1:

Manage water abstraction and discharges of contaminants within the entire Selwyn Te Waihora sub-region to avoid, remedy or mitigate adverse cumulative effects on the water quality of Te Waihora/Lake Ellesmere, rivers and shallow groundwater; and the flow of water in springs and tributaries flowing into Te Waihora/Lake Ellesmere and achieve, in combination with non-regulatory actions, the freshwater objectives and outcomes for the sub-region.

309. As discussed above, and mentioned by Dr Scott in her evidence, the applications have a moderately high risk of deteriorating the aesthetic quality of groundwater supplying neighbouring residences, but a very low risk of health based effect on public supply wells. The Applicants have suggested a range of measures to manage and reduce the likelihood of groundwater contamination as a result of the quarry deepening and filling procedures proposed. As an isolated quarry it would be easier to establish responsibility for contamination arising from the Selwyn site, provided the proposed water quality monitoring is carried out. We also consider the site poses less risk of long term contamination due to more recent environmental controls and placement of higher quality fill than the other sites. We regard the application is not inconsistent with this policy.

National Policy Statement for Freshwater Management (NPS)

310. The ECan s42A Report stated:

'The NPS for Freshwater Management took effect on 1 July 2011, amendments to the NPS were made in August 2014. The document sets out the objectives and policies which direct local government to manage water in an integrated and sustainable way, while providing for economic growth within set water quantity and quality limits. The relevant objectives and policies of the NPS for Freshwater Management are assessed below:

Objectives A1 and A2 deal with water quality issues.

Objective A1: 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, at least as affected by secondary contact with fresh water; in sustainably managing the use and development of land, and of discharges of contaminants.*

Objective A2: The overall quality of fresh water within a region 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.

Policy A3: 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.

The applicant considers that the extensive mitigation and monitoring measures will be substantial to address the potential effects on freshwater quality. Given this the proposal is considered consistent with the NPS for Freshwater Management. We consider the applicant's proposal, if not appropriately managed may result in adverse effects on groundwater quality. However, the applicant has offered a number of management, mitigation measures and monitoring as discussed above to ensure the potential for an adverse effect on groundwater is minimised.

Overall we consider the applicant is proposing to undertake the activity with an understanding of the risks of the adverse effects which could occur on freshwater quality if the activity is not undertaken appropriately. However, we consider the applicant has offered a robust set of mitigation measures which are included in the recommended condition set of this report.

Subject to careful management and compliance with the conditions as recommended we consider the proposal across all sites to be consistent with the National Policy Statement for Freshwater Management.'

311. The ECan Reporting Officers comments rely on strict adherence to conditions of consent, which would include a very high quality of 'deep' fill material, strict compliance with WAC, testing and checking of individual loads, robust groundwater quality monitoring, and mitigation measures if despite all precautions contamination was found in downstream wells. In addition, we also note it is dependent on increasing the proposed QFMS level by 1m to HRGL, which the Applicants did not accept.
312. As we have discussed above, we have serious doubts as to the effectiveness of the proposed conditions to mitigate the risks of contamination and consider the proposed QFMS level is too low to sufficiently avoid and mitigate adverse effects from inundation and saturation of the groundwater. The Applicant is unwilling to increase the QFMS and we doubt if an effective condition can be imposed as required by Policy A3 of the NES. We cannot therefore be confident that Objective 2A of the NPS would be always achieved, particularly over the long term.

Summary – Relevant Objectives and Policies

313. A large proportion of the relevant objectives and policies in all the statutory documents we have examined are very directive or are expressed in absolute terms, and require maintenance, enhancement, improvement, or protection of water quality, ecology, and the natural and cultural environment. These provisions make no allowance for the scale

and extent of adverse effects, or for remedying or mitigating them. While this may be a matter of judgment of scale and degree, all expert witnesses agreed that there would be some degree of adverse effects on groundwater quality. What was in dispute is the extent and scale of such adverse effects and their significance. None of the expert witnesses suggested that the applications would maintain and enhance groundwater quality or other environmental values.¹⁴ Our approach therefore, in taking a literal approach, has been to conclude that the applications would be contrary to these provisions. This is not necessarily fatal to the overall assessment of the proposal, unless section 104D of the RMA applies, because extent, scale and significance of the adverse effects must still be assessed and decisions made accordingly. We would not decline consent simply because the applications are literally contrary to the provisions, if the likelihood of actual adverse effects were not sufficient to justify this.

City Plan

314. We have found that most of the relevant objectives and policies are very directive and make no allowance for scale and degree of adverse effects, or for remedying or mitigating. We consider these provisions seek to avoid adverse effects and that the Applicant has not sought to do so by increasing the proposed QFMS, as recommended by the Reporting Officers. Accordingly, we find that the proposal is contrary to the City Plan as a whole.

Operative Christchurch Replacement District Plan

315. We note that Chapter 3 Strategic Objectives of the Replacement District Plan is operative. These provisions are intended to be over-riding and direct how other provisions should be assessed. These provisions emphasise both the necessity of promoting sustainable economic activity, and avoiding unnecessary controls on land use activities. However, they also recognise the necessity for safeguarding natural, cultural and environmental values. They tend to not be as absolute as the City Plan and recognise scale and intensity of effects, and opportunities for mitigation and remedying of effects. We do not consider the applications to be contrary to the objectives and policies of Chapter 3 as a whole, but find them contrary to several of the key objectives relating to the natural environment and manawhenua.

Proposed Christchurch Replacement District Plan

316. We consider the applications are consistent with some of the provisions of this plan, which in general is less absolute than some of the other documents, but are contrary to others. Overall, we consider the applications are contrary to these provisions in an overall sense because of the direct relevance and importance of the provisions to which the proposals are contrary.

Land and Water Regional Plan.

317. As a result of the assessment made against the relevant objectives and policies above, we consider the applications overall to be contrary to almost half of the relevant objectives and policies, and inconsistent with a number of others. They are consistent with a small number of these provisions. Overall, we consider that the applications are contrary to the objectives and policies of the LWRP.

¹⁴ Except for one suggestion by Dr Temple that minor increases in hardness would actually bring the groundwater closer to the Guideline Values of the Drinking Water Standards. This was strongly rejected by many of the submitters.

Canterbury Regional Policy Statement

318. We consider the applications are contrary to most of the relevant objectives and policies of the RPS.

National Policy Statement for Freshwater Management (NPS)

319. We consider the applications would be inconsistent with the NPS.

National Environmental Standard for Sources of Drinking Water Regulations 2007 (NES)

320. We agree with Mr Chapman, in the Applicants' ROR, that the NES Drinking Water is not applicable to these applications.

Other Matters

Precedent

321. It was suggested that these applications, if granted, would establish a precedent. We agree. We consider it would be very surprising if other existing and future quarry operators were not encouraged to make similar applications and to expect similar outcomes. In our view, this concept would be likely to become the new standard for quarries in the Canterbury groundwater zone. We would have two concerns about this. One is the localised effect on local groundwater supplies in the immediate vicinity of the sites (and perhaps ultimately a cumulative effect). The second is the longevity effect, with even more sites competing for the very limited supplies of high quality deep fill. This would inevitably lead to both longer direct exposure for residents nearby to the direct adverse effects of quarries, and delays in the final rehabilitation of sites.

322. In accepting that there would be a precedent, we note that the first application to extend beyond the Rural Quarry zone in 2006 (granted by the Environment Court), which was in itself a small incremental extension of the Road Metals Quarry at Miners Road, was soon followed by a number of other similar, successful applications both for incremental extensions at Miners Road and new sites at Templeton, McLeans Island and Conservators Road, all outside the Rural Quarry Zone.

323. As these applications are for non-complying activities, with effects that are more than minor, and are contrary to directly relevant objectives and policies, we are entitled to take the potential precedent effect into account. We find there are no unique circumstances which would set these applications apart and agree that granting the consents sought would set a precedent for future applications.

Effectiveness of Proposed Conditions

324. Mr Chapman submitted that the Applicants are entitled to be treated on the basis that they will comply with the conditions of the consents sought and that concerns raised that the consent conditions may not be complied with are not relevant to this determination. However, in response to questions, Mr Chapman agreed that historical compliance with the conditions of the existing consents to be replaced and changed was a relevant consideration for us.

325. We are concerned that the current disposal of concrete slurry (in combination with back filling with 'cleanfill') is causing adverse effects on local groundwater quality. This is troubling given that the activity is supposed to occur in accordance with the consent conditions imposed (10m above groundwater table, into a clay lined bunded area, and a limit on volumes discharged). This clearly demonstrates the potential for adverse effects more than 500m away from the point source, and that current methods of discharge are inadequate or the activity is not being appropriately managed. We note the Applicants' have offered to surrender this consent, if the applications are granted, but we urge ECan to take action on the basis of demonstrable adverse effects on groundwater quality.
326. We do not accept that the raised calcium levels in the McDonagh's water supply can be dismissed as merely aesthetic effects and consider they should be able to clean their glassware and windows (and see out of them). We are concerned by the quarry operators lack of interest and action in investigating and remedying the problem. We consider it is unlikely to NOT be related to quarrying activities at Miner Road, but acknowledge that the cause-effect link is difficult to prove. We consider it is highly unfair to expect the McDonaghs to prove there is a problem and then to establish a cause. The RMA should protect local groundwater users from such adverse effects.
327. We record we have significant concerns regarding current compliance with consent conditions at Miners Road and enforcement of those conditions by the consent authorities. We have heard evidence demonstrating non-compliance with excavation depths, hours of operations, dust control measures, and cleanfill quality. We were also provided with evidence of non-compliance with cleanfill quality and dust control at Selwyn Quarries. While we have not placed significant weight on this in our overall consideration of the applications, we record that it has given us significant cause for concern over the effectiveness of the proposed consent conditions to mitigate adverse effects.
328. Overall, we have significant concerns about the practicality and effectiveness of some of the proposed conditions offered to avoid and sufficiently mitigate any adverse effects that may occur, and the long term nature of some of those effects. While we would be totally in favour of the diligent monitoring proposed, we have significant concerns about the following:
- (a) Difficulties in siting enough groundwater monitoring wells in the right locations and in monitoring them frequently enough. Because of the likelihood of preferential flow paths in the gravels, it is possible that spikes of contamination could pass through between wells or during intervals between monitoring occasions, and be picked up in local water supply wells.
 - (b) Uncertainties about whether there might be vertical flow as well as horizontal within the aquifers, so that deeper wells might also be affected rather than just the shallow wells referred to by the Applicants' witnesses.
 - (c) We note there is no 'Chain of Custody' of the fill material and that the operators are reliant on the honesty and integrity of the fill provider with regard to its provenance and likely contamination. We also agree with Mr Watts that the costs of landfilling at authorised facilities provides a strong incentive to mis-describe material and its origin; and that 'site shopping' and the alarming rates of unauthorised dumping are well recognised.

- (d) Virtual impossibility of any effective remediation, should an unsuitable load or loads be placed in the 'deep' fill, either accidentally or otherwise. Once backfilled, it would be nearly impossible to locate any source of contamination and remove it.
- (e) Inadequacy of the proposal to provide alternative drinking water supplies to neighbouring residents should their wells become contaminated, as the offer included the need for proof that the contamination came from a particular site. Given the siting of most of the quarries, it would be difficult to establish which quarry had caused the problem and to establish responsibility to provide the alternative supply. These applications have been made collectively by number of operators, but if granted would be held individually. There is no proposal for collective responsibility beyond the application phase. The likely future attitude of the operators was, for us, represented in their peremptory dismissal in the right of reply of the obvious adverse effects to their water supply demonstrated by Mr and Mrs McDonagh in their evidence. We therefore regard this particular condition as little more than notional.
- (f) Lack of information regarding the number of potentially affected domestic wells around the application sites.
- (g) There was no convincing demonstration of the ability to detect and control the proposed 2 percent limit on organic matter in the 'deep' fill, noting that this level in itself was very concerning to some of the expert witnesses. No testing of soil was proposed to limit carbon content.
- (h) We also note that the whole proposal depends on diligent observation and performance of a complex suite of conditions for 100 percent of the time, over a long period of time. We accept that non-compliances from time to time are very likely. We noted with concern the bland admission by Mr Warren for the Applicants that operators already ignore the limits on hours of operation and operate at night when it suits them, and the clear and obvious failure of the consent regime relating to dust that is occurring, regardless of who or what is at fault. A very recent example of what appears to have been a serious breach of dust conditions was the opening up of the Winstone quarry extension reported to us by Mr Tewnion, described above. As well as our reservations over individual conditions we are simply not confident of the ability of the quarry operators to consistently adhere to such a complex set of conditions for a long period.

Three Kings Quarry

329. We have had regard to the Three Kings Quarry decision. We consider that there are significant differences that make that site non-comparable to our consideration of these applications. However, this decision did highlight to us the importance of avoiding contact between groundwater and back fill material as the first line of defence in protecting groundwater quality over the long term.

Mahaanui Iwi Management Plan (MIMP)

330. We received very little evidence on the MIMP. We accept the evidence of Ms Burgman and Ms Murchison that Ngāi Tahu consider the applications are contrary to the objectives of the plan.

Section 104D

331. Our consideration of the applications, as non-complying activities, requires that the consents can only be granted if either the effects the application are considered to be minor or less than minor; or the applications are not contrary to the to the objectives and policies of the relevant plans.
332. We have set out our assessment of matters above, and conclude that the potential effects on existing groundwater quality, ecological values, cultural values, and the duration of the combination of existing adverse environmental (at Miners Road only) are likely to be more than minor. We conclude that the applications, overall, are contrary to most of the directly relevant objectives and policies of the City Plan and the Proposed Replacement District Plan; and to some of the Operative Replacement District Plan provisions. In addition, while not strictly related to our consideration under 104D, for completeness, we also conclude that the applications are contrary to the provisions of the LWRP and the RPS. We therefore find, on the basis of the evidence, that the non-complying applications do not pass either threshold test of section 104D and cannot be granted.

Section 105

333. Mr Chapman submitted that the requirements of the Act were fulfilled at both the application stage and in evidence presented. He considered the nature of the discharge is only a potential, given there is no direct discharge into groundwater. He stated that the location of the sites had been determined by careful evaluation of sensitivities in terms of the current state of the groundwater at specific locations and their sensitivities to drinking water sources and community supplies.
334. Mr Chapman noted that the evidence of Messrs Warren, Savage, Faulks [sic] (perhaps in mistake for Forbes?) and Bligh set out the reasons for the Applicants' proposed choice of sites based on mitigation measures, providing for long term aggregate demand, maintaining efficiency of the sites and transportation to markets, and long term certainty of the depth of excavation.
335. In relation to section 105(1)(c), Mr Chapman stated that alternative methods of discharge had been evaluated in terms of the definition of 'deep' fill and alternative disposal of material to Kate Valley landfill.
336. In addition to the comments made in the their s42A Report, ECan's Reporting Officers provided an assessment of section 105 in their Addendum dated 27 June 2016. The Reporting Officers considered that the receiving environments to be 'highly sensitive' to the proposed activities given the close proximity of downgradient shallow domestic bores and the unconfined nature of the aquifer. They noted a number of potential methods to address effects on the receiving environment including improved quality, management and monitoring of back fill material, not back filling at all, the use of clay liners (which was not supported) and raising the proposed QFMS.
337. We are extremely conscious that the Miners Road and McLeans Island application sites are within the Christchurch Groundwater Protection Zone (as defined in the LWRP). The zone is intended to give a high level of protection to the high quality potable water that

supplies the city of Christchurch. The protection zone is located over the recharge area of the Christchurch aquifer system and is designated under the LWRP as an area of 'high intrinsic vulnerability', where groundwater is poorly protected because of the combination of highly permeable surface sediments and downward hydraulic gradients.

338. The Selwyn Quarries site is located over the recharge zone of the wider Canterbury Plains aquifer, which has similar hydrogeological properties, making that area equally vulnerable to contamination.
339. We consider the receiving environment must be considered to be highly sensitive to the discharge of contaminants, despite the fact the groundwater system's sheer size, volume and speed of water movement make it relatively resilient to localised point source contamination. We consider, we are extremely fortunate that the groundwater system is able to disperse and dilute pollutants given some of the alarming examples of the historic landfilling activities across the protection zone and within the existing quarry sites themselves. However, we do not view these examples or the lack of measured adverse effects on the overall groundwater quality to be justification for increasing any risk of anthropogenic pollution.
340. We consider there are alternative receiving environments for 'cleanfill' disposal outside of the groundwater protection zone and for the supply of aggregate. We see no justification for the proposed method of discharge (i.e. placing back fill into the groundwater fluctuation zone) given the shortage of suitable material to rehabilitate the existing quarry pits. Overall, we consider the applications to be inappropriate in the groundwater protection zone given its vulnerability to contamination and highly sensitive nature.

Part 2 of the Act

341. The purpose of the Act is to promote the sustainable management of natural and physical resources. Section 5 imposes a duty on consent authorities to promote sustainable management, which is defined to mean:
- "...managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while—*
- (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
- (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment."*
342. Section 6(f) requires the Councils to recognise and provide for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga.
343. Section 7 lists various matters to which regard shall be had in achieving the purpose of the Act. The matters of particular relevance to these applications are:
- (a) kaitiakitanga;*

- (aa) the ethic of stewardship;*
- (b) the efficient use and development of natural and physical resources;*
- (c) the maintenance and enhancement of amenity values;*
- (d) intrinsic values of ecosystems;*
- (f) maintenance and enhancement of the quality of the environment;*
- (g) any finite characteristics of natural and physical resources.*

344. Section 8 requires that the Councils take into account the principles of the Treaty of Waitangi.
345. We do not consider that the quarry deepening proposal supports the sustainable management purpose of the Act. It is acknowledged that the proposal will allow for the Applicants' companies to provide for their economic well-being, represents an efficient use of quarry land and existing quarry infrastructure, and would contribute to the supply of aggregate to the Christchurch region. However, the purpose of the Act also requires that the potential of natural resources (in this case, the quality of the groundwater system) are sustained to meet the needs of future generations, the life supporting capacity of water is safeguarded, and adverse effects on the environment are avoided, remedied or mitigated. In our view, granting consent to these applications would not achieve this, for all the reasons already stated.
346. The Papatipu Rūnanga have raised concerns about the impacts on cultural values, in particular on groundwater quality and on the mauri of the waters of the tributaries of the Ōtukaikino Stream, which is considered wāhi tapu due to its traditional use in the preservation and treatment of important tūpāpaku (deceased). We do not consider that granting consent to the proposal would adequately fulfil the section 6(f) requirement to recognise and provide for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga.
347. Many submitters have identified the high quality of Christchurch's untreated, aquifer sourced drinking water as one of the City's most precious natural resources, and as something which must be given the highest level of protection possible. They have emphasised that the risk of contamination is too great and that these risks far outweigh the potential benefits to the community from the aggregate gained, especially given the level of uncertainty about various aspects of the proposal and the complexity of the underlying aquifer system. We strongly agree. We hope the Applicants, as the good corporate citizens they told us they are, listen to the community in which they operate and depend on.
348. With respect to section 7, while we acknowledge the applications would enable efficient use and development of natural and physical resources (land and gravel), we consider the proposal will not maintain and enhance the quality of the environment.
349. For these reasons, we consider that the proposal is contrary to Part II of the Resource Management Act 1991.

Conclusion

350. We wish to record that even if we had found that the non-complying applications passed one of the section 104D threshold tests, we would not have granted the applications under section 104 because of our concerns about the adverse effects, the shortcomings of the applications under so many of the objectives and policies of the statutory instruments, the inadequacies of the proposed conditions, and the sensitivity of the groundwater protection zone (receiving environment), as discussed above. This is also our conclusion with regard to the Selwyn Quarries application and McLeans Island applications for land use consents and discharge permits under the LWRP.
351. It is therefore our conclusion on the basis of the evidence before us, and for the reasons set out above, that the purpose of the Act can best be achieved by refusing all of the resource consents sought.

Decision

352. For the reasons outlined above, it is the joint decision of the Canterbury Regional Council and the Christchurch City Council, pursuant to sections 104, 104B, 104D, 105 and 108, and subject to Part 2 of the Resource Management Act 1991, to REFUSE all of the applications sought.

Dated at Christchurch this 31st day of August 2016



Sharon McGarry
Independent Hearings Commissioner (Chair)



David Mountfort
Independent Hearings Commissioner



Hugh Thorpe
Independent Hearings Commissioner